The
GEOGRAPHICAL JOURNAL

Vol CII No 2 R.G.S. *August 1943*

THE NORTHERN MARCHES OF YUNNAN

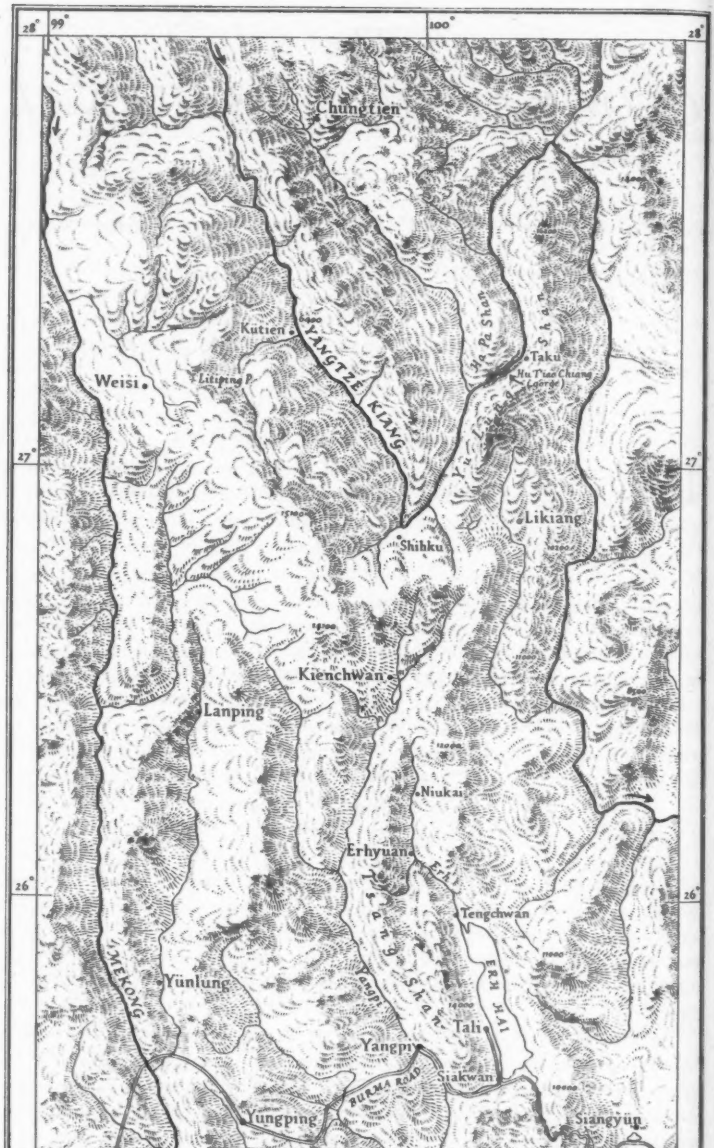
C. P. FITZGERALD

Meeting of the Society, 7 June 1943

THE journey which is the subject of this paper was undertaken in the winter of 1937, consequently some of the observations made upon the progress of new motor roads may now be out of date. The starting point was Tali, a city which lies just off the Burma Road in western Yünnan. Following the main caravan route to Tibet northwards as far as Likiang, I then made a diversion into the loop of the Yangtze, traversing the great gorge between Yu Lung Shan and Ha Pa Shan, and rejoining the road to the north at Shihku. This section of the journey was described in detail in an article in the *Journal* for September 1941 under the title "The Tiger's Leap."

From Shihku I followed the main Tea road northwards to Weisi. The direct route between Tali and Weisi is a part of the road linking the tea-growing district of Puerh (Ningerh) in south Yünnan with Tibet, via Atuntze. As such it is, of course, an ancient trade route, still in active use although no part of it had at that time been adapted to wheeled traffic. The first section of this journey from Tali to Likiang, a distance of 100 miles, is for Yünnan travel relatively easy going. Likiang is five stages from Tali, and there are only two passes to cross. This is exceptional in Yünnan where, as the ranges run from north to south and most roads pass from east to west, a journey usually involves at least one pass in every stage. Because the valleys are often too precipitous to follow, the traveller, even when proceeding from south to north, has often to climb to the crest of the ridge and detour round the narrow gorges.

The first stages from Tali are along the fertile plain by the shore of the Erh Hai, and then up the valley of the Erh river. Tengchwan, the first stage point, is now connected to the Burma Road by an extension of the branch road from Siakwan to Tali. This short section of about 50 miles was only occasionally used for official traffic in 1937 and 1938, and then only in the winter, as there were no permanent bridges or culverts and the streams were only passable in the dry season. A few miles north of Tengchwan the Erh river emerges from a narrow gorge 5 miles or more in length. At this point


28°
99°
100°
Chungtien
Kutien
YANGTZE KIANG
Weisi
Litiping P.
Taku
Hu Tiao Chiang (George)
Likiang
Shihku
Kienchwan
Lanping
Niukai
Erhyuan
Tengchwan
ERH HAI
Yünlung
Yangpi
Tali
Siakwan
BURMA ROAD
Yungping
Siangyün
Mitu
MEKONG
Miles
5 0 5 10 15 20
Heights in feet
27°
26°

the old road climbed to the crest of the ridge, but the motor road was then being cut out of the side of the gorge.

Erhyüan, the next district city, does not stand upon the road to the north, but a few miles from it. This habit of building the through routes so that they avoid some of the smaller cities is frequently found in Yünnan. Such towns serve as market centres for the farmlands around them and are not engaged to any marked degree in the long distance trade of the caravan roads. Probably for this reason, and because the citizens do not wish to have too much contact with the muletteers and other travellers, the roads were made to pass them by at a convenient distance. Erhyüan, in a small isolated lake plateau, is therefore a quiet place, enjoying the advantage of a constant hot water supply as boiling springs rise within the town itself.

Niukai, the second stage from Tali, is also in this hot-spring region, and perhaps has a future as a Spa. At present there is a sort of public bathing-pool into which a cool spring is run in order to make the temperature of the water bearable. Men and women use this pool on alternate days. The earth-works of the motor road to Likiang were then already completed as far as Niukai, although there were no bridges. Beyond this point the road crosses the first pass Ch'ou Shui Kuan, "Stinking Water Pass" (so called from a sulphurous spring); and the difficult task of cutting the motor road out of the sides of this mountain had not at that time made great progress.

Ch'ou Shui Kuan is the divide between the Erh river, which flows from Erhyüan lake, and the Yangpi river, which rises north of Kienchwan and flows south to the Mekong. From this pass, above the Kienchwan lake plateau, one obtains the first full view of the Yu Lung Shan, still 50 miles away, but towering over all the intermediate ranges. Two stages along the valley of the Yangpi through the town of Kienchwan the road crosses the considerable pass which is here the Mekong–Yangtze divide, and hence-forward the character of the country changes. The plain of Likiang itself is the last of the typical Yünnan lake plateaux, the most northerly of the chain which stretches southward through Kienchwan, Erhyüan, Tali, and Mitu to Paoshan. North and west of Likiang the country is split up into the deep parallel valleys of the Yangtze, Mekong, and Salween. These narrow valleys, almost gorges, are the only areas where any cultivation is possible, and consequently the only areas able to maintain any population. The dividing ranges, sparsely inhabited by Li Su tribesmen, remain covered with dense virgin forest.

Even greater difficulties would be encountered in the construction of the projected roads linking north Yünnan with north-east Burma or Assam than in the building of the Burma Road. The mountains are higher and steeper; the rivers wider and more numerous, and there is no large local population to provide labour. This last obstacle, and the difficulty of feeding a labour force if it were imported from elsewhere, is probably the main reason why no great progress had been made with these schemes before the Japanese invasion of Burma rendered them temporarily useless.

Likiang, the most northerly Chinese city of any size in Yünnan, is a close-packed planless town of narrow alleys reminiscent more of a south Chinese city than the usual "northern" design found in Yünnan. Most Yünnan towns

are built four square, four streets from the four gates meeting at a central point, like the arrangement of a Roman camp. This design, found all over north China in cities of great antiquity, was probably introduced into Yünnan by the Ming dynasty conquerors, if not by the Mongols who preceded them. Likiang, which was the capital of the old Na Khi state before the Chinese conquest, has never been so thoroughly assimilated as the cities of the central Yünnan plateaux, and still retains a foreign air.

The townspeople themselves, though probably calling themselves Chinese and speaking the language, are well mixed with Na Khi and Tibetan stock. The surrounding villages are Na Khi to the north and west and Min Chia to the south; and there are Li Su settlements in the neighbouring mountains. The city is, moreover, an important centre for trade with Tibet. Tibetan merchants and nomads from the grasslands throng its narrow streets and crowded market. The place has a frontier atmosphere, it is a sort of Yünnanese Peshawar, a character emphasized by the fact that it is the headquarters of the Chinese command in North Yünnan.

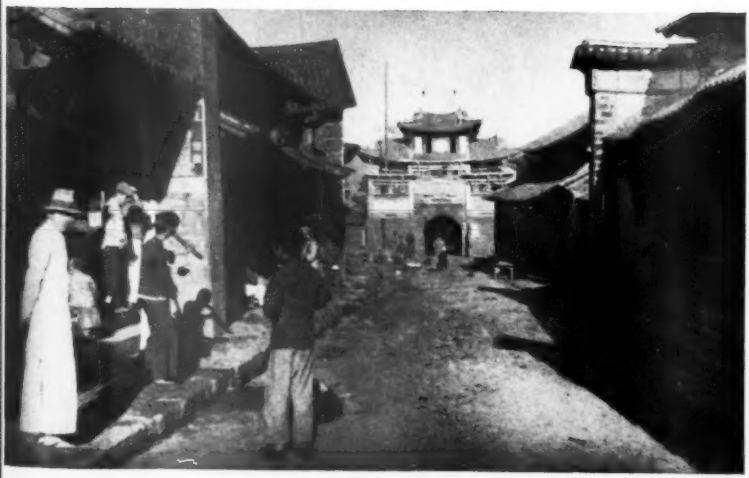
The main route to the north from Likiang strikes north-westward to the southern tip of the great Yangtze bend at Shihku, skirting the south-western end of the Yu Lung Shan range. This range, with the Ha Pa Shan on the other bank of the Yangtze, form the two walls for the great gorge known as the Tiger's Leap (Hu T'iao Chiang).

Shihku, a small market town perched above the deep valley of the Yangtze, is the most northerly settlement of the Min Chia people. The topography of this district is unusual. The valley of the Yangtze, which has followed a course almost due north and south, turns sharply at Shihku and runs north between the great snow ranges through the Hu T'iao Chiang. But a wide and fertile valley, continuing the direct line of the upper Yangtze valley, runs southward from Shihku to Kienchwan. This valley is raised some 200 or 300 feet above the level of the Yangtze so that the river, where it turns at the bend, cuts across the Shihku valley at a lower level. No river of sufficient size to have eroded the Shihku valley now flows down it. After a few miles the streams from either slope unite to form the headwaters of the Yangpi, which even at Yangpi town, 100 miles farther south, has not yet become more than a fair-sized stream. The Yangpi river, and thus the whole of the Shihku valley, is in the Mekong basin.

From Shihku the road to Tibet follows the west bank of the Yangtze for four stages to the little town of Kütien. The valley is narrow and the margin of cultivated land rarely more than a few hundred yards in width and often only a few feet. The mountains on either bank rise to 12,000 or 13,000 feet, increasing in height towards the north. Such villages or collections of houses as are to be found are extremely poor and even short of food. During the winter months this region is barely able to feed itself. It was impossible to obtain any other food than turnips; even eggs, which in China are universally available, could not be had. Rice, unless the traveller carried his own supply, was unprocurable. During these four stages my cook was forced to serve meals consisting only of rice and turnips; yet such is the versatility of the Szechwanese that not one of the eight meals made up of these rather unpromising ingredients either looked or tasted the same.

Motor road at Niukai

Erhyüan city



Tengchwan city

Small lake near Shihku

Shihku plain

After Shihku there are no more inns. Dirty and often dilapidated though they are, the Yünnan inn does afford an assured resting place to the traveller, who, if he brings his own bedding, need not be inconvenienced by the unswept dustiness of the tumbledown rooms. There is always a kitchen, and always rice already cooked; stabling for the mules, and a willing host who is anxious to accommodate guests. But in the High Yangtze valley there were no inns. Every stage ended in a wearisome search for some hovel large enough, and, still rarer, clean enough, to take the party and stable the mules. The inhabitants, having no food to sell, were indifferent or unwelcoming.

The traffic of the northern road beyond Shihku is slight, such as there is is largely run by Tibetans or half Tibetans from Weisi. These people never frequent inns, even in those parts of the province where they exist. Whether the innkeepers object to the total absence of personal cleanliness which characterizes the Tibetan nomad, or whether the latter prefer to camp in the fashion of their own country, which in any case they must do on long stretches of their journey, the Tibetan traders who come south to the Tali fair never enter an inn in the city, but camp on the mountain slopes beyond the walls. Presumably for these reasons there is no profit in keeping an inn on the road to Weisi.

It would obviously in a dry climate be much more convenient to follow the example of the Tibetans and camp out. But the Chinese, at least those of the south-west, have a horror of sleeping in the open. Any hovel, however grimy, smoke-blackened, and crowded, seems to them preferable to a night in the woods or fields. This attitude is probably due in part to social prejudice. The Chinese of Yünnan and Szechwan hold themselves to be a race far superior to the Tibetans, whom they regard with a tolerant contempt as semi-savages. To camp out is therefore to "go native" and is unthinkable.

At Kütien the road to Weisi and Tibet leaves the Yangtze valley for the long climb over the Mekong–Yangtze divide. The village itself, inhabited by a mixed race in which Tibetan blood and custom is conspicuous, is the point at which the Communist army under Ho Lung, one division of the forces which made the celebrated Long March, crossed the Yangtze and struck up into eastern Tibet. This event, which had happened two years before, was still the main topic of conversation in Kütien, which had perhaps never before seen the passage of a large army. The fact that the Communists did not commandeer either mules or porters, and paid fair wages for such transport as chose to offer its services, has made a deep impression on the people of this little town, and has no doubt disposed them to welcome any Communist force which might come their way in the future.

Kütien to Weisi is two stages; entirely taken up by the ascent and crossing of the Litiping, the first really considerable pass on the road to Tibet. The summit of the pass is between 12,000 and 13,000 feet, and in winter is liable to heavy snowfalls which close it for several days on end. From Kütien the first day's stage is an ascent through dense forest of ilex, pine, and rhododendron—the same vegetation which is found on the Ts'ang Shan at Tali between 12,000 and 14,000 feet. Here the forest is found much lower, from 8000 to 10,000 feet. This is only one of the numerous evidences of a changed climate north of Likiang. North of the Ch'ou Shui Kuan no winter crops

can be grown. While the plain of Erhyüan is green with ripening beans and wheat, the plains of Kienchwan and Likiang are bare and frost-bound in the early morning. Therefore the changing vegetation on the slopes of these mountains is not a true indication of the altitude unless allowance is made for this change of climate. The Tali region, and the central plateaux of Yünnan in general have a Mediterranean type of climate and vegetation; often one might imagine oneself to be in Provence; but North Yünnan has a climate more resembling that of the lower valleys of Switzerland. A small village inhabited mainly by Li Su, and built in the characteristic log cabin style which is typical of this district, is the last halt below the Litiping itself. In spite of the fact that all travellers passing in either direction must of necessity sleep here, before or after crossing the pass, there are no inns, and the inhabitants showed no desire to find room. The prospect of earning a little money to eke out the scanty produce of their limited fields did not seem to make any appeal. The Chinese grimly attributed this indifference to the probability that these same villagers, acting as intelligence agents for the Li Su bandits of the forest, did better out of the robbery of travellers than by catering for their needs.

The last stage to Weisi, the crossing of the Litiping pass, is a stern pull up the very steep and densely forested mountain side until the summit is reached. Surprisingly the crest of the pass is a flat plateau, with patches of forest and wide grassy spaces, astonishingly English in appearance. If it were not for the magnificent panorama of ranges to the east, beyond the Yangtze to Yu Lung Shan, and westward to the high peaks of the Mekong-Salween divide, one would certainly imagine oneself to be on a Surrey common. The air was crisp, although the sun shone. Small streams among the grassy glades were edged with ice, and snow lay banked in shady places. While eating a mid-day snack in this peaceful English scene a party of Chinese merchants, bound for Atuntze and the forest country of north-eastern Burma where strange "medicines" can be bought, came over to us and politely intimated that they were now moving on. We did not appreciate the significance of this until they added that they would not advise a small party of people to remain behind, as the seemingly peaceful woods held Li Su robbers who were no doubt even then observing us. The scene seemed less English as we accompanied our Good Samaritans down the long descent to Weisi.

Weisi, the last Chinese settlement in Yünnan, for all points farther north or west are inhabited by Tibetans or Li Su, was founded as a garrison town, and still retains this character. The walls, though no doubt adequate in their day against Li Su tribesmen or Tibetan raiders, are now more symbolic than practical. But the situation of the town, upon a steep hill overlooking the valley of the Weisi river which flows within a few miles into the Mekong, is strong. It cannot be called an interesting town. There are few temples, except one to Kuan Ti the soldier's patron, which are worth a visit. The shops sell mostly articles of utility and there is no local industry. Weisi remains what it has always been, an isolated military post on the very fringe of the Chinese world. The Lamasery, a mile or two from the city, although not a large or famous foundation, attracts a considerable pilgrimage, perhaps

View from Litiping pass

On the Litiping pass

Suspension bridge, Kütien

Walls of Weisi

because it is the most southerly outpost of Tibetan Lamaism in a country whose racial composition is slowly changing.

Many surviving evidences, as well as historical records, show that the Tibetans are being pushed back in north Yünnan. Places such as Shihku and Likiang still have Tibetan names, which are probably the older names, existing before the Chinese re-named these cities. The names of other places in Yünnan suggest that they may be corrupt Tibetan, and the elaborate defences of passes leading north survive to prove the former danger of deep Tibetan raids into the southern valleys.

It does not appear that apart from the building of fortified cities such as Weisi, the Chinese have actively taken steps to evict the Tibetan population. The advance of the Chinese, or of native Yünnan stocks such as the Min Chia who have acquired the main features of the Chinese culture, is rather by colonization than conquest. The Chinese arrive and cultivate, the nomads withdraw to the untouched pastures.

DISCUSSION

Before the paper the PRESIDENT (The Rt. Hon. Sir GEORGE CLERK) said: Mr. Patrick FitzGerald needs few words of introduction to this meeting, for he has twice in the last few years given us valuable papers, the fruit of his long sojourn in Western China before this war. Many of us remember with pleasure the account of the making of the Yünnan–Burma road which he gave us in January 1940; also his paper on the most interesting Tali district of Western Yünnan two years later. This evening he is to take us farther into Yünnan and to describe its northern borders.

Mr. FitzGerald then read the paper printed above, and a discussion followed.

The PRESIDENT: We were honoured by the presence of Dr. George Yeh, Counsellor to the Chinese Embassy. I had hoped to induce him to say a few words in regard to Yünnan but he has, unfortunately, been called away.

Admiral Sir WILLIAM GOODENOUGH: We saw an interesting photograph of various fields in the bed of the Yangtze. Are those fields owned separately by individuals or does some individual own them all and let them out? And are they all ricefields or is some other form of agriculture carried on there?

Mr. FITZGERALD: Rice is grown in summer; beans and wheat in the winter. In the Tali district most of the fields, some of them not larger than the floor of this Hall, would have been individually owned; in the other parts of the region a person might have owned as much as 40 acres, which is about the largest holding in the whole of the Tali district.

Dr. HUGH SCOTT: The charming old suspension bridges we saw had a little roof-building at each end. Is there a special custom of loading and unloading?

Mr. FITZGERALD: The little structures at each end of the bridges may protect the places where the chains of the bridge are anchored into the rock. They are also temples. Some contain a little altar to some protecting deity. Occasionally one sees people stop to light a stick of incense as they go on their way. I think the idea of having those little gateways is largely artistic.

The PRESIDENT: I was much interested in those timber houses which Mr. FitzGerald said one might expect to see in Canada or Western America. They can also be seen any day in Slovakia or in the Carpathians. People who work in wood find out and evolve the same type of architecture, wherever they may be. The photograph of the timber house was exactly like one I used in Slovakia,

which had a kitchen with plank beds all round it and another room in which I had a bed made of the local pinewood, with little pine branches strewn as a mattress. That was the type of hut the Slovak peasants put up for me when I was shooting stags.

Another interesting point was the change from what our lecturer described as the Mediterranean to the Northern European climate. His photographs brought out that change very well indeed. The scenery in the heart of Central Asia might quite easily have been seen anywhere in Northern Europe. It now remains only to thank Mr. FitzGerald for his most interesting and beautifully illustrated lecture.

Not all the place-names in Mr. FitzGerald's paper can be found in the Chinese List of Post Offices. Where possible names follow the List, elsewhere the Wade-Giles romanization.

THE CAPACITY OF THE UNITED STATES TO SUPPORT POPULATION

WILLIAM J. BERRY, Western Michigan College

THERE has long been considerable interest in the maximum number of people that may live in America. In recent times it has been rather widely accepted that this maximum number has been attained, or very nearly so, and that any considerable increase in population must be accompanied by lowered standards of living if not indeed in actual starvation of many people. Most geographers however are of the opinion that many more people might live in our land even without much change in our habits of living, and that our population would be multiplied two or more times if ways of living in vogue in some other lands were practised. In many instances the subject has been somewhat differently stated: What will the eventual population of America be?

Geographers, for the most part, have avoided the subject although they are best qualified to discuss it. Many factors influence population changes; the trends of the present are largely unpredictable, and many things may occur that cannot be foreseen. Nevertheless, there is enough interest in the subject to warrant some attention being directed to it.

One way of arriving at an approximate capacity is by comparing the various parts of the United States with other parts of the world, and assuming that as many people may live here, per unit of area, as live in the most densely populated part of the world with similar conditions of climate, surface, and mineral resources.

This investigation tries to determine the capacity of the United States by such comparisons. The country is divided into what may be called "population regions," each having a similar physical complex throughout and therefore in all parts approximately the same population potential; and the areas of the regions are computed. Then we determine the region of the world

with the same or similar physical complex which has the densest population of any region with that complex. The number of persons per square mile in that comparison region is multiplied by the number of square miles in the American region under consideration, and the sum of these products is the total population capacity. This assumes, rather unsoundly, that the region of densest population is fully populated and not over populated.

The map shows these fifty population regions of the United States, the name of the comparison region, and its density. The boundaries and size are open to criticism. Probably there are not enough regions, and not sufficient similarity in population potential in some of them to satisfy the definition given earlier. For the most part the comparison regions are in the continent of Eurasia, probably the only continent that is much beyond the pioneer stage of settlement.

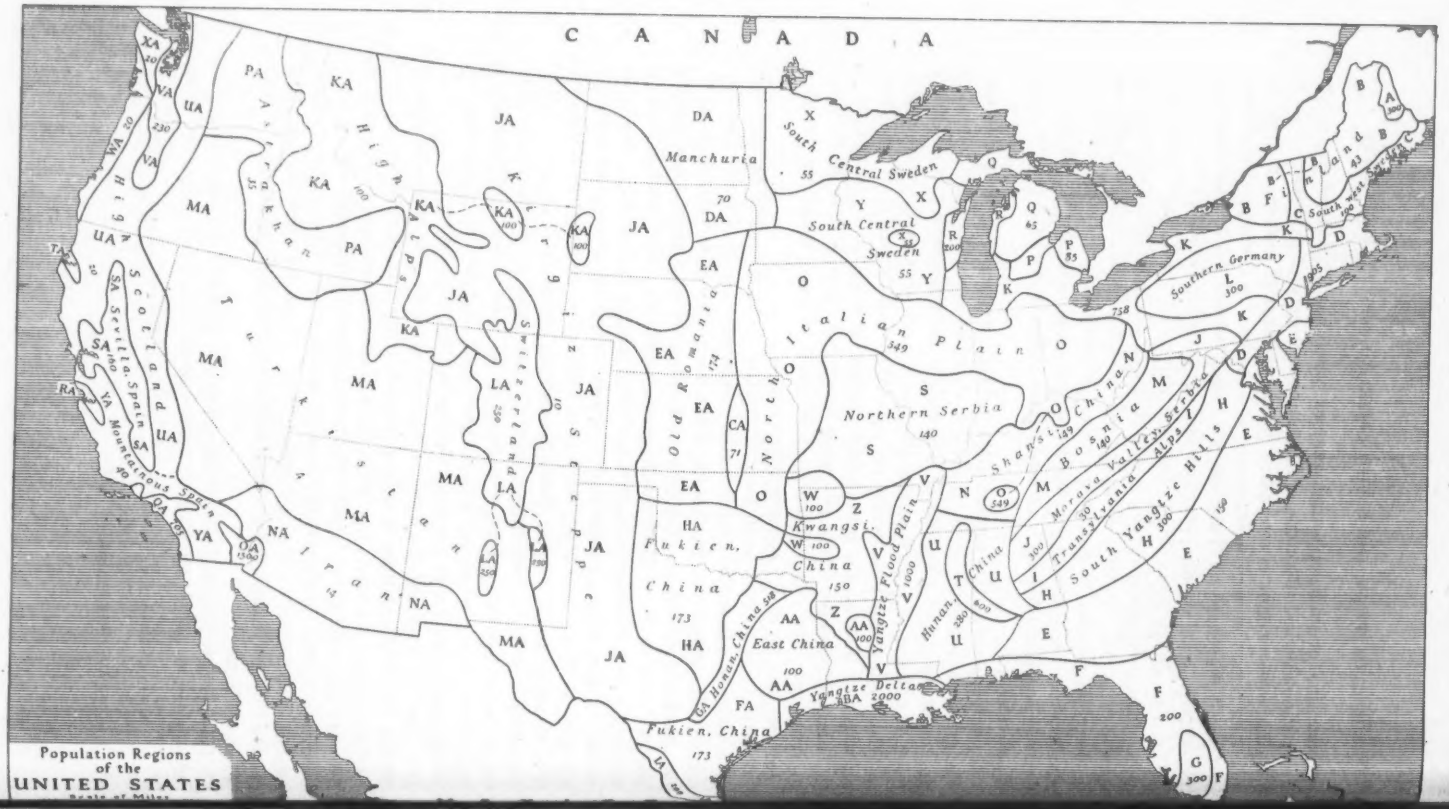
If comparisons of this sort be valid, several uses may be made of them. The greatness of a land lies most of all in the abundance of opportunities for its inhabitants to get a livelihood. The data in the table seem to show that a common opinion of Americans that their land is the greatest, is well founded, and that their country's capacity for population is outstanding. These comparisons may be used also in forming immigration policies. It seems evident that immigration need not be restricted because of a dearth of usable land and its resources. The comparisons may be used to good advantage in land-planning, and no doubt in many other ways.

We need not go into detail for each region. Consider region O, the Corn Belt, taken as physically similar to the western Po Basin of Italy. Both are regions with continental climate; in both nearly all the land slopes so gently that erosion is not serious; the soils are fertile; and about three-fourths of the grade A soils of the United States are in region O.[1] The Corn Belt has a somewhat better climate for agriculture than has the Italian plain. From the middle of May until the middle of September temperatures average higher in the Corn Belt, and rainfall is greater there during the summer half of the year. The average rainfall during April–September at Milan is 20·5 inches[2]; at Omaha it is 20·64, at Des Moines 22·92, and at Indianapolis it is 21·18.[3] The annual rainfall at Milan is 39·7 inches; at the three Corn Belt stations it is respectively 27·7, 32·04, and 39·9 inches. At all four stations, more than half of the precipitation is in the April–September half of the year.

I have not been able to find good comparisons for the industrial regions D and K stretching from Southern Lake Michigan to the Atlantic. I have assumed that if the total population of the United States were to increase, the populations of those two would increase also, though probably not as much relatively as that of the country as a whole. Nor have I been able to find a region similar to the Atlantic Coastal Plain. There are parts of China that have a similar climate, but no large part of coastal China is as smooth as the Coastal Plain.

There is only a remote relationship between standards of living and density of population, except for cases of definite over-population or for very sparse

[1] National Resources Board, Pt. II, Report of Land Planning Committee.
[2] Kendrew, 'Climate of the Continents,' p. 127.
[3] U.S. Weather Bureau.



The sketch-map above shows the population regions of the United States of America, and the name of the region with which

The sketch-map above shows the population regions of the United States of America, and the name of the region with which each is compared, with its population per square mile.

In the table below the first column of figures gives the area of each lettered region in thousands of square miles; the second column gives the Potential Population in millions, estimated by comparison with the region named and its density of population per square mile which follows.

A	2·7	8·1	Eastern England 300
B	48·7	2·1	Finland 43
C	17·9	1·8	South-western Sweden 100
D	28·9	26·1	1½ times Pop. 1940 905
E	108·5	16·3	Comp. with neighbouring regions 150
F	41·7	8·3	Estimated 200
G	13·9	4·2	Bengal 300
H	68·9	20·7	Southern Yangtze Hills 300
I	17·4	0·5	Transylvanian Alps 30
J	40·6	12·2	Morava valley, Serbia 300
K	55·7	42·2	Twice Pop. 1940 758
L	42·7	12·8	Southern Germany 300
M	29·5	4·1	Bosnia 140
N	51·5	7·7	Shansi, China 149
O	231·8	127·4	North Italian Plain 549
P	8·7	0·7	Southern Sweden 85
Q	15·3	0·8	Luneberg Heide, Germany 65
R	5·7	1·9	Coastal Sweden 200
S	94·0	13·2	Northern Serbia 140
T	11·5	6·9	Red Basin, China 600
U	76·3	21·4	Hunan, China 280
V	29·5	29·5	Yangtze Flood Plain 1000
W	19·1	1·9	Rough areas, Central China 100
X	77·3	4·2	South Central Sweden 55
Y	72·6	4·0	" " "
Z	45·3	6·8	Kwangsi, China 150
AA	45·3	4·5	Sparsest part East China 100
BA	25·8	51·5	Yangtze Delta 2000
CA	17·9	1·3	Kirin, Manchuria 71
DA	60·4	4·2	Manchuria 70
EA	83·0	14·4	Old Romania 174
FA	59·7	10·3	Fukien, China 173
GA	17·7	9·2	Honan, China 518
HA	79·9	10·4	Fukien, China 173
IA	6·2	1·2	Punjab 200
JA	331·0	3·3	Kirgiz Steppe 10
KA	135·4	13·5	High Alps 100
LA	69·2	17·5	Switzerland 250
MA	485·5	1·9	Turkistan 4
NA	34·0	0·5	Iran 14
OA	6·0	9·0	Nile Delta 1500
PA	97·3	3·4	Astrakhan 35
QA	4·3	3·0	Campagna, Italy 705
RA	1·3	0·8	Viscaya, Spain 600
SA	25·6	4·1	Sevilla, Spain 160
TA	0·6	0·4	Viscaya 600
UA	84·2	1·7	High Scotland 20
VA	11·9	2·7	Denmark 230
WA	4·8	0·09	South-western Norway 20
XA	6·5	0·1	High Scotland 20
YA	28·1	1·1	Mountainous Spain 40

Total Potential Population of the U.S.: 556·2 millions
Population at the Census of 1940: 131·7 millions

populations where the people are so few and far apart that common necessities are obtained only with great effort. It is not difficult to disprove a common opinion that dense population and low standards necessarily run hand in hand. In the Netherlands the population is very dense, more than six hundred people per square mile, but the common standard of living there has been as high as in any land. Britain is another example of the same kind. In the United States a strip of land including Boston on the north-east and Washington, D.C., on the south-west has a population that is probably the densest on earth, yet the high American standard prevails in that populous region. On the other hand, the lowest standards in the United States are in the sparsely populated dry lands of the South-west. One may cite instances of densely and of sparsely populated lands where there are high standards of living and where there are low. There seems to be little, if any, relationship between standards of living and density of population.

The writer will welcome comments from geographers on the validity of the comparisons he has made in this paper. The investigation has been interesting, at least to play with, and he thinks it may be of some value. He would like to have the opinions of others.

To comply with the author's desire to elicit criticism; the Editor sent advance proofs of this paper to a number of British geographers, of whom six have written the following comments that should assist Dr. Berry in pursuing his interesting line of enquiry.

Dr. William Berry's map of the Population Regions of the United States is both interesting and ingenious. There is little doubt that many a young student of Geography will, in the near future, find himself set the task of examining it closely. But equally there is little doubt that he will be asked to apply his knowledge to the exposure of some of the fallacies of the method employed rather than to ratifying the author's conclusions. He would probably ask, for example, how the population densities of the areas used for comparison were arrived at, what were the census dates, what the treatment of the urban population figures. He would further point out that the estimates of mineral wealth were unsatisfactory. Where in the North Italian Plain are the great coalfields such as the area of the U.S.A. compared with it possesses? Has Switzerland or the High Alps the great metal resources of the Rockies? Again, he would say, population capacity hinges not merely upon physical conditions and natural resources, but upon the technical equipment of the inhabitants: their skill, education, capital goods, and resources. Moreover such factors of location as advantageous juxtaposition and good natural accessibility are of great importance in determining the commercial possibilities of an area. Would the North Italian Plain be so densely peopled if it lacked a Genoa or a Venice? Or if it lacked the Swiss and German consuming markets, and lay (as on this map) between Sweden and Serbia? This is not to say that Dr. Berry's method of population forecast should be abandoned, rather that it must be developed with much greater precision. E. G. R. TAYLOR.

We find Dr. Berry's paper interesting and hope that he will attempt some more detailed work later. The subject of "similar physical complex" seems to need some elaboration; the "population regions" of the United States are

essentially relief-type regions not climatic regions; this should be stated. Also we would like to know how far the presence of minerals has been considered.

We suggest that High Scotland does not make a very suitable partner for region UA of the map; the Pyrenees might have been considered. And for comparison with region K we would suggest the European zone along the hill-foot from Holland to Silesia; and for region D, the country from the lower Rhine to the Mersey. In each case the length and area are comparable as well as the variety of economic development. In his comparison of the Corn Belt with the western Po Basin of Italy there ought to be some mention of the effects of irrigation in the latter; irrigation is responsible for the very high production of rice and of fodder crops.

Finally, while it seems true that there is little relation between standards of living and density of population, we think there is a very real relationship of these with densities of agricultural population even when the latter category is not very strictly interpreted. A. G. OGILVIE and A. GEDDES.

The population of an area at any time is a function of a large number of variables which include not only the physical conditions and the character of the natural resources involved in its maintenance. As crucial are the efficiency of the technical equipment, the intensity of labour, the scale of the economic organization, and the cultural values of the community. Moreover the direction and rate of change in population will be affected by external factors such as the attractiveness of the area as compared with other accessible territories with reference to migrations of labour and capital equipment and to exchange.

The notion of optimum population is significant only with reference to specific values for these variables, and will vary with them. It may be roughly defined as the level at which, with given resources and efficiency of production, the addition *or* subtraction of a further unit of population will result in a decline in the per capita level of output. Dr. Berry's calculations do not take account of this. He recognizes the dependence of a concept of capacity population on assumptions concerning the standard of living (which itself depends in great part on productivity) referring to a maximum beyond which "any considerable increase in population must be accompanied by lowered standards of living." Even this is valid only on the assumption of static available resources, techniques of production, and capital equipment. Beyond that he is content merely to point to some instances of high population density associated with high standards of living, *i.e.* levels of consumption (not making clear the dependence of the latter on the high productivity through advanced techniques wherein they contrast with conditions in the Orient) and of low densities with low standards of living related to fairly obvious poverty of resources.

The optimum for a territory with any given physical conditions and natural resources under an advanced "western" exchange economy, characterized by the dominance of power-machine technology and a high ratio of capital equipment to population, is very different from that for a territory with similar resources and a dominantly subsistence economy characterized by human and animal power techniques. For this reason, even assuming any close homology between the realizable resources of the areas in question, densities of population in various parts of China, India, and even eastern Europe lack significance in assessing present or future optima for various regions in the United States. The assumption of paragraph 3 of the paper is both fallacious and unrealistic. It should be added that the analysis of the functional relations of population to resources, technology, and economic organization have received considerable

attention. A practical application of the analysis to the "Prospects of International Migration" is to be found in recent articles by A. J. B. in the *Bulletin of International News*.

DARYLL FORDE.

Lebensraum, like Liberty, is difficult to define; though we know well enough when we lack either. The land-man ratio, rightly or wrongly conceived, lies at the root of much world unrest, and is for the geographer an absorbing study.

The population of a region however is not just a matter of its natural resources, and of the standard of the techniques by which these are developed. There are few, if any, self-sufficing regions, and a little thought reminds us that the population of a region, like that of a country, is dependent upon external trade relationships, as well as upon internal resources and cultural conditions. Now the regions in Dr. Berry's map of the United States are not there in the same relationships to each other, or to the outside world, as are their prototypes in Europe and elsewhere.

It seems to me that this fact alone vitiates any estimates of possible population based on such methods, though the results are not without significance. The map is an interesting presentation of physically homologous regions. The main criteria would appear to be climatic. Topography, soils, and basic resources of industry (coal, oil, water power, iron, etc.) have obviously received consideration, and, as obviously, have proved less amenable to large-scale regional comparison.

L. RODWELL JONES.

Dr. Berry's idea is ingenious but a little simple. The main fallacy would seem to be that of basing his comparisons on physical (including climatic) considerations only, without regard to industrialization, to the high standard of living which the American people have established, or to the relatively low standards prevailing in the mainly Asiatic areas with which parts of the United States are compared. Generally speaking, high population densities in Eurasia are accompanied either by high standards of life in industrialized communities, as in Britain and Belgium, or by low standards of life, poor nutrition and conditions approaching overpopulation, as in parts of India and China. No doubt the lower Mississipi region could support one thousand or even two thousand persons to the square mile if they were all prepared to live on home-grown rice; but it is unlikely that the present population would look favourably on such a prospect; and one of the avowed peace aims of the United States is the improvement of standards, not their debasement.

S. H. BEAVER.

LANGUAGES AND DIALECTS IN CHINA

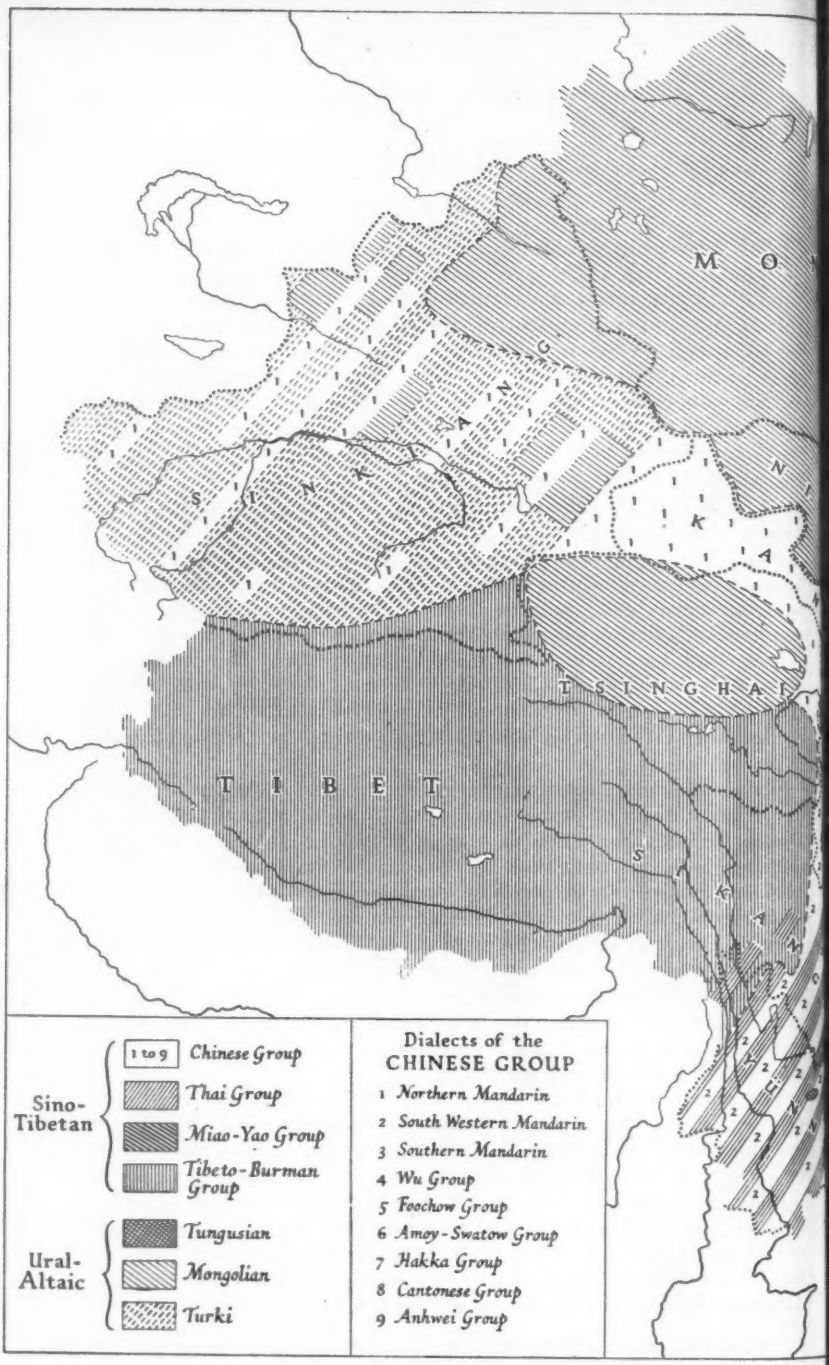
YUEN REN CHAO

THE accompanying Linguistic Map of China, based upon the (small) Shun Pao *Map of China*, revised edition, 1934, gives an idea of the distribution of languages and dialects in China. So far as areas are concerned it looks as if nearly half of China were non-Chinese speaking. Since however the population of China is concentrated in China proper, actually only about 5 per cent. of the people speak non-Chinese languages. Within China proper the dialects of Chinese may be divided into roughly nine main groups. Of the Cantonese group, the Hakka group (to which most of Kiangsi belongs), and the Amoy-Swatow group (to which a part of Hainan Island belongs), are characterized by their preservation of ancient consonantal endings *-m*, *-p*, *-t*, *-k*. The Foochow dialect forms a group apart, though near the Amoy-Swatow group in many respects. The Wu-dialects (including Shanghai and Yungkia (Wenchow)) and the Hsiang group [1] (including most of Hunan, though Changsha is not typical) are characterized by their retaining ancient voiced or sonant initials like *b-*, *d-*, *g-*, *v-*, *z-*, etc. The majority of Chinese, roughly two-thirds of the population and covering three-quarters of the area of China proper, speak some form of a standard speech known as Mandarin among Westerners and among the Chinese as *Kuan-hua*, Official Speech; *P'u-t'ung-hua*, General Speech; or *Kuo-yü*, National Language. These and other transcriptions in this note are upon the Wade system. The National Language in the new official script is Gwoyeu.

Within the limits of common intelligibility and great uniformity in vocabulary, Mandarin may be further sub-divided. A Northern group includes the Hwang Ho basin, and all of Manchuria. To this group belongs the dialect of Peiping, whose pronunciation has been taken as the standard. A Southern Mandarin group covers the area between Hankow and Nanking. An extremely uniform group is South-western Mandarin, covering several provinces containing Chungking, Kunming, Kweiyang, and Kweilin, extending eastwards in the form of a wedge up to and including the Wu-Han cities. All Mandarin dialects agree in having very simple sound systems. They have four or five tones. They have a common vocabulary for the most frequent words like *ni*, you; *(w)o*, I; *t'a*, he, she, it; *ti* or *te* for possessive or qualifying particle; *cheko*, this; *nako*, that; *shemo*, what; *pu*, not; etc.

The mutual intelligibility between speakers of these different dialects depends, as in the case of other languages, both upon their dialects and upon the education of the speakers. The three groups of Mandarin dialects may be regarded as one language, like the language of all English-speaking people of the world. Then, if abstraction is made of the fact, with all its consequences, that all China writes one common idiom in one common system of orthography, we can say that the other groups of dialects are about as far from Mandarin as say Dutch or Low German from English. On the whole, the differences between any two groups of dialects in China are less marked than

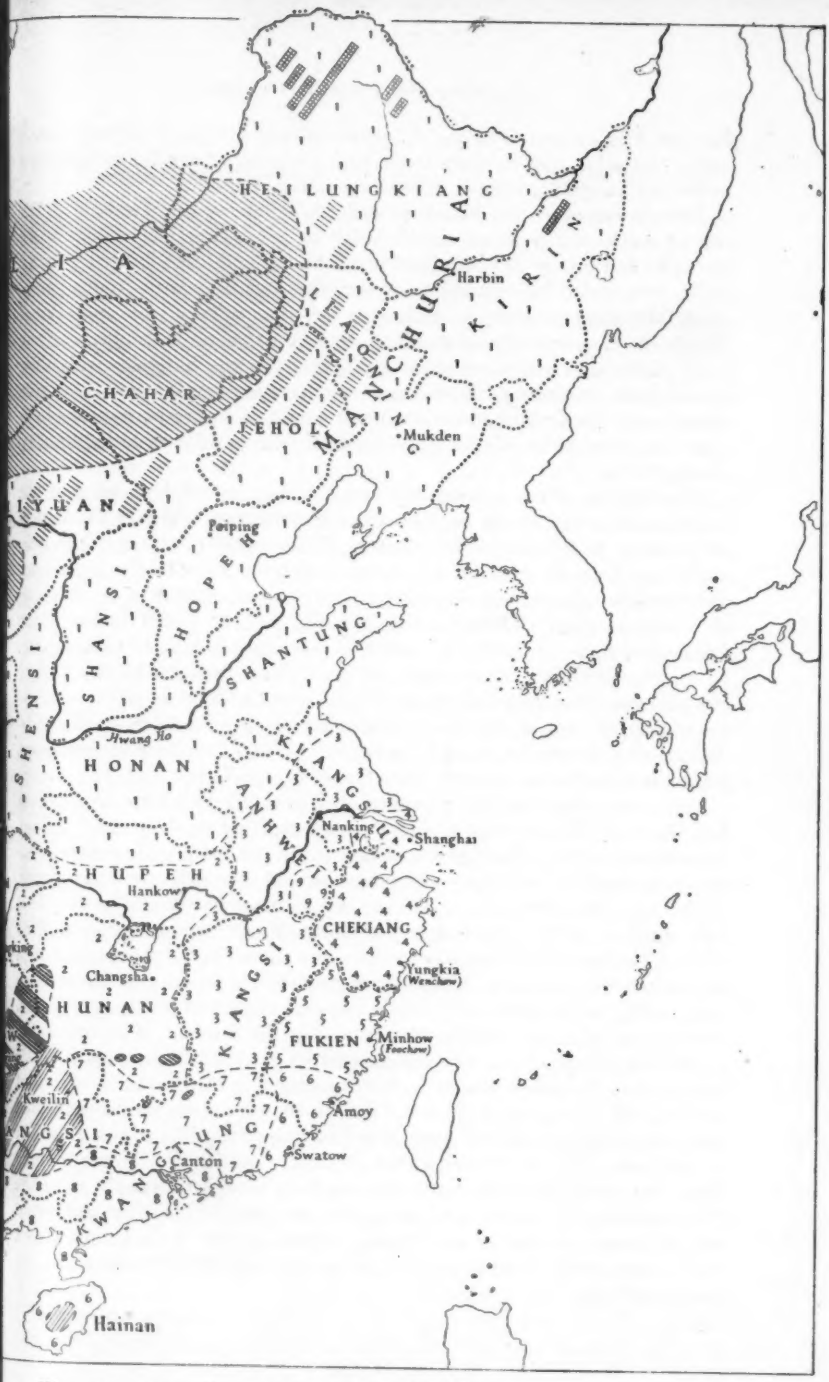
[1] A sub-division of the S.W. Mandarin group spoken along the Hsiang river.



LINGUISTIC MAP OF CHINA

Drawn by the Royal Geographical Society to illustrate Dr Chao's pa

Language-areas from Shun Pao Map of China 1934



It is not possible to show certain boundaries
(Editor Geogr Jour)

between English and German. A speaker of one group of Madarin, say a native of Harbin, can converse freely with a speaker of another group, say a native of Chungking, without misunderstanding each other.

As to speakers of non-Mandarin dialects, ignorance of Mandarin is felt not so much as a personal short-coming as a practical inconvenience for travellers and people in educational or public work. Most educated persons whose own dialect belongs to one of the other non-Mandarin groups would speak Mandarin of sorts by picking it up from contact with speakers of Mandarin. Consequently at public meetings linguistic difficulties arising from dialect differences are quite negligible. For the illiterate, with their limited basic vocabulary, and for those who stay in one place and have little contact with speakers of other groups, it would of course be impossible to cross the boundaries of the non-Mandarin group without losing mutual intelligibility.

The dialects of the overseas Chinese form an important aspect of the language situation, as can be seen from the attention given to the dialect programmes by the Central Broadcasting Station XGOY. In the South Seas the Amoy-Swatow and the Cantonese dialects are the most important, though these regions made a notable advance in recent years in the teaching of Mandarin. The Chinese in the Hawaiian Islands speak Hakka or the Chungshan form of Cantonese, which is very close to that of Canton city. In continental United States, practically all Chinese residents speak a variety of Cantonese from one of the four districts to the south-west of Canton. As the dialect of Canton city has considerable prestige, speakers of the sub-dialects all understand it and try to speak it. It is therefore usual for foreigners intending to learn Cantonese to learn that of Canton city.

Foreigners often confuse Mandarin with the literary idiom or *wenli*, an English word derived from Chinese roots but never used by the Chinese. Mandarin is a dialect or a group of similar dialects, with its system of pronunciation and its vocabulary and grammar, and is actually spoken. *Wenli*, on the other hand, is neither a dialect nor a language in the usual sense. It is only an idiom with its vocabulary and grammar, but no pronunciation of its own. A passage in *Wenli* written in characters is read in the pronunciation of the dialect of the speaker. A newspaper published in Peiping, in Chungking, in Shanghai, or in Canton, will use the identical characters for the same news. Apart from infrequent dialect phrases used for local colour, it is impossible to tell the locality of a Chinese newspaper without looking at its title or date-line. But when a news item or an article is read aloud by different readers, who do not speak the same dialect, the text serves as a many-sided diamond which gives out all sorts of colour-tones according to the direction of approach. This basic unity in the characters and in the Chinese literary idiom has raised some doubts in the minds of thoughtful people as to the danger of disunity arising from the present adoption of the colloquial idiom and the future adoption of an alphabetic system of writing for China. From much close study, I have reasons to believe that the difficulties are not insurmountable.

THE ROMANIZATION OF CHINESE PLACE-NAMES

FOR some thirty years the practice of map-makers who use the Roman alphabet has been stabilized. The Conference of the International 1/M Map resolved that Chinese Place-Names shall be spelled on the Map as in the Chinese List of Post Offices. This provided for the names of provinces, cities, and towns, but did nothing for mountains and rivers, until the publication of the Chinese Postal Atlas in 1919 with Romanized names.

The Postal System was a compromise between several accepted transcriptions and local pronunciation, leaving out all niceties of aspirate and tone. It made arbitrary changes to distinguish between places which would otherwise have the same name in the Romanized form: a great practical advantage. But the Chinese Government has now approved a New Official Chinese Latin Script: GWOYEU ROMATZYH, and it seems worth while to examine at an early stage what will happen to our maps and indexes if G.R., as it is called for short, displaces the Postal System in Chinese use; if we have some day to spell Peiping as Beeipyng; Changshu in Kiangsu as Charngshwu, and Changshu in Kiangsi as Jangshuh. To understand how Postal Guide *Chang* can become *Charng* in one place and *Jang* in another we must look briefly into the question of characters, aspirates, and tones.

The Romanization of Chinese is not the transcription of many thousand characters, but the representation of a few hundred sounds. Each character represents a word of one syllable, and many characters have the same syllabic sound, but different meanings. When spoken they can be distinguished only by judgement of the context, which is usually no guide to proper or place-names. Hence a Chinese asking the name of a village cannot write the characters down from what he hears, but has to enquire which of the many characters having that sound is intended. Thus there can be no question of a reversible Romanization of Chinese.

A character may be pronounced quite differently in different parts of China. Any educated man can therefore recognize a place-name by its characters, but could not always pronounce it to be intelligible to a man from another part of China. Any Chinese who speaks Northern Mandarin, which has come to be called the National Language, would read the characters of every Post Office name in the Northern pronunciation, unless he has local knowledge, and would not recognize the correct dialect pronunciation. Thus the name which is printed conventionally in the Post Office List as Hongkong, and is locally pronounced something like Hoenggong, would be read by him as Shianggaang.

Each character has its own meanings, but shares often with many other characters the same sound, or at any rate the same syllabic sound. In a certain glossary of Chinese Topographical Terms there are nine characters all pronounced Hsiang, but they are partly distinguished by variety of tone. Thus of these nine five are pronounced with the first tone, the "*upper even*, with a slightly plaintive effect"; one in the second tone, the "*lower even*, rather suggesting an interrogation"; one in the third, the "*rising tone* in which

incredulity seems to be expressed"; and two in the fourth, the "*departing tone*, final and decisive." These definitions of tone are from a Preface by Dr. Lionel Giles. He considers them as equivalent to those given by Wade, who says that "in the second tone, the *lower even*, the voice is jerked, much as when in English we utter words expressive of doubt and astonishment," while the International Phonetic Alphabet calls the second tone the *high rising*. Being thus warned that definitions are not much help to understanding tones, we may be glad that Wade denotes them simply by superiors $^{1\ 2\ 3\ 4}$; thus Hsiang^{3}. The tones, says Wade, are "so delicate as to be retained only after long and anxious watching by the foreign ear, but so essential an acquisition that, until by practice his intonation be accurate, the foreign speaker is in hourly danger of making very laughable mistakes." Unfortunately then, for Wade's notation, the small superior figures are themselves so delicate that printers generally leave them out: not even Playfair in his celebrated work 'The cities and towns of China' has shown them; and so far as we can discover, they never have been used in writing place-names, though so essential to the pronunciation: as essential, but not so disturbing to the spelling, as the aspirates, with which we have next to deal.

The aspirate was at one time indicated by inserting an *h* after certain consonants, among them *p*. But since *ph* was liable to be pronounced as *f*, Wade preferred the inverted comma ' to the *h*; he wrote *ch'*, *k'*, *p'*, *t'* when he meant them to be pronounced *ch*, *k*, *p*, *t*, and wrote them *ch*, *k*, *p*, *t* when they were to be pronounced *j*, *g*, *b*, *d*. Wade does not explain why he chose this method, so easy to misunderstand. It was not a question of transliteration but of finding groups of Roman letters to represent the sounds of Chinese characters, and his choice of initial consonants seems a little perverse. Anyhow, the aspirate has met the same fate as the superior figures; both have disappeared from the names on maps and in the Postal Guide.

Gwoyeu Romatzyh.—We have received from Dr. W. Simon, who is Reader in Chinese in the University of London, several copies of the small book of Tables, Rules, and Illustrative Examples for Gwoyeu Romatzyh (National Language Romanized), and with his kind explanation have been able to appreciate some of the main advantages the authors hope to gain by departing so largely from Wade, though professing to have based themselves broadly upon it. First, they write *ch*, *k*, *p*, *t* for the aspirated *ch'*, *p'*, *k'*, *t'*, which those who can speak the language of phonetics call "voiceless aspirated initial plosives and affricates"; while they write *j*, *g*, *b*, *d* for what Wade wrote as the "half-voiced unaspirated" *ch*, *k*, *p*, *t*. Thereby G.R. throws overboard the aspirates and does not so far as we can see ever mention them. We are assured, however, that the transition from *p* to *b* makes very nearly automatic the passage from aspirated to unaspirated, and is printer-proof. Secondly, G.R. represents the four tones, not by superior numerals following the syllable, but by putting otherwise more or less unwanted Roman letters into the word. And incidentally it abolishes "a whole army of other auxiliary signs (aspirates, hyphens, circumflexes, semi-circles, umlaut-dots) which are often left out in order to simplify the printing."

The representation of tones in G.R. may be shown by the following examples; the basic form of the word is in heavier type.

Wade:	ch'uan$^{1-4}$	chuan$^{1-4}$	k'ung$^{1-4}$	kung$^{1-4}$	nien$^{1-4}$	p'ien$^{1-4}$	p'u$^{1-4}$	pu$^{1-4}$
G.R. 1	**chuan**	**juan**	**kong**	**gong**	**nhian**	**plan**	**pu**	**bu**
2	chwan	jwan	korng	gorng	**nian**	pyan	pwu	bwu
3	choan	joan	koong	goong	nean	pean	puu	buu
4	chuann	juann	konq	gonq	niann	piann	puh	buh

Thus the tone is shown sometimes by introducing consonants meant to be dumb, sometimes by altering the vowels. Pronounced according to the rules of the P.C.G.N. they might, we suspect, be unlike what would be approved. But if they are to be put on maps, who is to warn the unwary? The Preface maintains that G.R. has proved superior to any system which indicates the tones by auxiliary signs, because the tones can be remembered through the visual shape of the words. It says nothing about the pronunciation, which seems to be sacrificed to tone.

Yet there may be room for a compromise. In Table II, which is a concordance between G.R. and Wade, the basic form, generally in the first tone, is printed in heavy type. If we used this as the transcription for the word it would get over at any rate the difficulty of the initial aspirated and unaspirated consonants, though it would leave us doubtful about the vowels, especially since *y* can be either vowel or consonant. If tones are required one might readily insert the superior digit after each word which combines to form the name, without introducing the hyphen.

To explain the position Dr. Simon has very kindly at the request of the Editor provided the material for the following table:

The first column gives a number and name in Playfair, with tone numbers of the constituent words added in Wade's notation. The second column tries to show on the R.G.S.II system the way the name is pronounced in Northern Mandarin speech or National Language; J as in English; final vowels sometimes doubtful. The third column gives the spelling of the List of Post Offices, the fourth the spelling in G.R. The fifth column spells the names in the basic G.R., without the tone-variants; it comes much nearest to the second column.

Wade-Playfair		*Pronunciation*	*List of Post Offices*	*G.R. toned*	*G.R. basic*
422	Chao^{1}-yang^{2}	Jaoyang	Chaoyang	Jauyang	Jauiang
596	Ch'êng^{2}-tê^{2}	Chungdur	Chengteh	Cherngder	Chengde
548	Chêng^{4}-ting^{4}	Jungding	Chengting	Jenqdinq	Jengding
631	Chi^{4}-(hsien^{4})	Jishien	Kihsien, Hop.	Jihshiann	Jishian
637	Chi^{2}-(hsien^{4})	Jishien	Kihsien, Sha. S.	Jyishiann	Jishian
679	Ch'i^{3}-(hsien^{4})	Chishien	Kihsien	Chiishiann	Chishian
704	Ch'i^{2}-(hsien^{4})	Chishien	Kihsien, Sha.	Chyishiann	Chishian
848	Ch'iao^{3}-chia^{1}	Chaoja	Kiaokia	Cheaujia	Chiaujia
832	Chiao^{1}-(hsien^{4})	Jaoshien	Kiaohsien	Jiaushiann	Jiaushian
946	Ch'ien^{2}-(hsien^{4})	Chienshien	Kienhsien	Chyanshiann	Chianshian
1224	Ch'ing^{1}-ch'êng^{2}	Chingchung	Tsingcheng	Chingcherng	Chingcheng
1254	Ch'ing^{1}-chiang^{1}	Chingjang	Tsingkiang, Ki	Chingjiang	Chingjiang
1170	Ching^{4}-chiang^{1}	Jingjang	Tsingkiang	Jinqjiang	Jingjiang
785	Chiang^{1}-hsi^{1}	Jangshi	Kiangsi	Jiangshi	Jiangshi

	Wade-Playfair	*Pronunciation*	*List of Post Offices*	*G.R. toned*	*G.R. basic*
5542	Pao^{3}-tê^{2}	Baudur	Paoteh	Baoder	Baude
—	P'ao^{4}-t'ai^{2}	Pautai	Paotai	Pawtair	Pautai
5605	Pei^{3}-hsin^{1}	Beishin	Pehsin	Beeishin	Beishin
—	Pei^{3}-ch'iao^{2}	Beichao	Pehkiao	Beeichyau	Beichiau
6854	Ta^{4}-ming^{2}	Daming	Taming	Dahming	Daming
7274	T'ien^{1}-chin^{1} *	Tienjin	Tientsin	Tianjin	Tianjin
8962	Yung^{3}-fu^{2}	Yungfu **	Yungfu	Yeongfwu	Iongfu

* Playfair gives -ching which is now obsolete.
** Local pronunciation Inghok.

The Preface to the First Edition of Wade's 'Tzŭ Êrh Chi' (Progressive Course) was dated 1867; Playfair was published in 1879. He took it as axiomatic that Wade's orthography was the best. Yet he left out the tone-notation, and so far as can be discovered no one has ever made a list of place-names with the tones. It would be very odd if the above fragment in column I were the first of its kind.†

This first empirical reconnaissance suggests that if we transcribe a place-name in Basic Gwoyeu we shall come close to making it pronounceable by the R.G.S.II rules; pronounceable, that is to say, in the Northern Mandarin manner, which is much more than can be said for Wade, or for the Postal List. But this is only just a beginning. There are the other language groups to be considered, and it is far from certain that one is right in tying oneself to the Northern Mandarin when writing names in Kwangtung and Fukien. Probably the reconnaissance should be extended by making more comparative lists, on the lines of the above, for place-names in the several areas so well defined in Dr. Chao's paper.

A paragraph in a letter from Mr. Patrick Fitzgerald warns us what to expect.

> "Wade's initial *j-* is the most varying sound in the Chinese language. In Canton it becomes a *y-*, in the west of China more nearly a *z-*, and in the north it is very nearly *r-*. I myself have never found any place where it was sounded as an English *j-*, but it is said to be sounded as a French *j-* in some parts of the country. I have met it as an *l-*. Unfortunately it is a very common initial letter appearing in names such as *Ju Chou*, Jehol (Chinese *Je Ho*), and others, and above all in the word *Jih* meaning the Sun, and Day. There is no doubt that in the greater part of the Mandarin speaking area this initial is more nearly equivalent to an unrolled *r-* than to any other letter of the Roman alphabet. It would not however be sounded as any sort of *r-* by western Chinese, Cantonese, and in many of the Yang Tze provinces."

For convenience in making lists and indexes the initial consonant of the written name should give its approximate pronunciation. Wade fails conspicuously. So does the Postal List, especially because for many names pronounced *ch-* or *j-* it uses the archaic *ki-*, or less often *ts-*. Basic G.R. always

† Two days after this was written there came to hand the second number of a new publication: Studien zur Auslandskunde. OSTASIEN Bd. I Lieferung II. Deutsches Auslandswissenschaftliches Institut. No date; no indication of place of origin. This contains a useful "Zusammenstellung der Wichtigsten Chinesischen Geographischen Ausdrücke und Namen," by M. G. Pernitzsch; names transcribed on the Lessing-Othmer method, with Wade's tone numbers.

except in the last name of the above brief list, writes the initial consonant as pronounced, and an approximation to the vowel: perhaps sometimes a closer approximation to the vowel than the R.G.S.II representation.

When one says pronounceable by the R.G.S.II rules, one means, not the refined pronunciation which only a scholar and a specialist in phonetics can achieve, but the first approximation to a correct pronunciation which is all that one can expect from a man who takes some interest in the matter, but is not a specialist: what Mr. Aurousseau (*Geogr. J.* Nov. 1942) has called the broad rendering.

This brief experiment was designed to raise questions rather than to answer them. They can be answered only when we have more extensive and better contrived tables of comparison between the several systems of romanization, and some agreement upon the pronunciation expressed in R.G.S.II. The Editor will be glad to have criticisms upon the versions in the second column of the table, and any similar tables with examples of geographical names spoken in the other kinds of Mandarin.

The writer of this note is greatly indebted to Dr. Lionel Giles, Dr. Simon, and Mr. Patrick FitzGerald, who have between them supplied whatever may be of value in it.

A. R. H.

JOURNEY TO KILWA, TRANSJORDAN

AGNES HORSFIELD

IN November 1932, when the newly formed Desert Patrol was training in Transjordan under Glubb Pasha, news was brought to George Horsfield, then Director of Antiquities, that a village of stone houses had been discovered at Kilwa, in No-man's-land, near the south-eastern boundary of Transjordan and Sa'udi Arabia. Little time was lost in preparing an expedition; Dr. Nelson Glueck, of the American School of Oriental Research in Jerusalem, was asked to join, and we set out in three cars in early December.

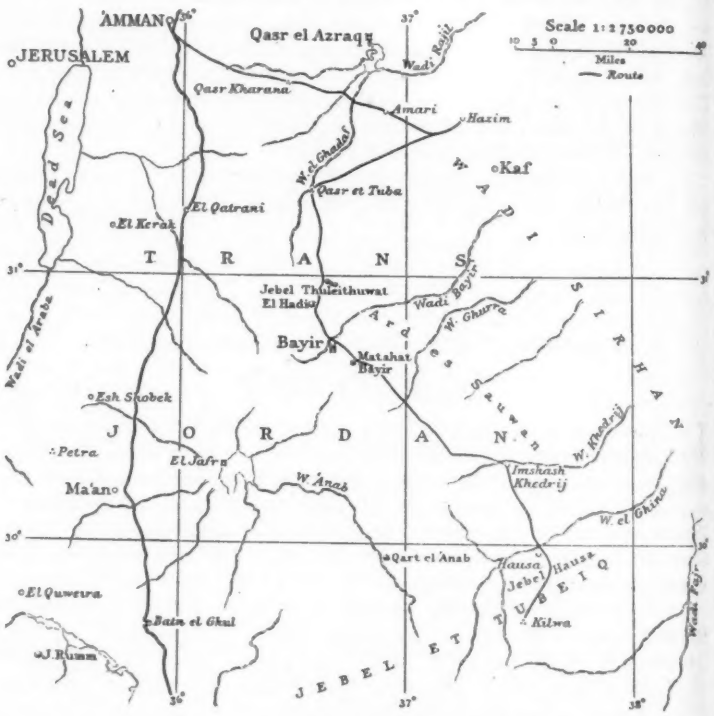
On the road eastwards from 'Amman, at the eighth-century A.D. Umaiyad pleasure palace of Kharana, we joined the route taken by Gertrude Bell from Damascus to Hayil, and spent the first night at the Desert Police Post near the Castle of Azraq at the head of the Wadi Sirhan. The eight-cylinder Ford Desert Patrol car lent by Glubb Pasha joined us there with armed Badawin in native kit beneath their khaki overcoats. Among them was the nephew of the Howeitat Sheikh Hamid, to act as *rafiq* if necessary. They went ahead picking out the route and caring for us like hosts.

As we went east through Amari to our first objective, El Hazim, the country, except for some deep wadi beds, was undulating with animals grazing on camel grass. Both these sites consist of a well and nothing else, the one at Hazim being a hole cut through the rock,[1] 150 feet deep, and of great antiquity. Hazim lies below a row of hills on which there is a Wahabi police post guard-

[1] "Gertrude Bell's journey to Hayil," by D. G. Hogarth, p. 9. Drawing water at Haizan well. *Geogr. J.* 70 (1927) 1–21.

ing the western frontier of Sa'udi Arabia. The Wahabis however did not notice us, and we branched off south-west to Qasr et Tuba to join the route to the Jebel et Tubeiq on the northern frontier of Sa'udi Arabia. The Qasr is a brick castle of the Meshetta period. On the way there we met neither man nor beast for the country was undulating *harra*, a black waste of flints with no sign of life. A flint pierced the oil container of the American baggage car, but we were able to hammer it down and solder it satisfactorily with a fig.

From Tuba this flat stony waste continued until a row of hills appeared



on the horizon. The first striking landmark was the Jebel Thuleithuwat, the Three Sisters, with its isolated cone-shaped, white-tipped peaks, rising abruptly in our track. Some 10 miles or so beyond we reached Qasr Bayir, Glubb's second desert police post, which lies on the trade route to Medina, 170 kilometres south of 'Amman and about the same distance east of Petra. The post had been built in the previous year and it was still possible to trace the ground plan of Walid II's palace by the well. A natural mound behind it was strewn with the typical painted Nabataean pottery, proving occupation of this frontier station two thousand years ago.

The next day we struck south again through a desert of black flints to

Khaider, marked only by two rough stone circles and two circular chert stones with Thamudic inscriptions. Another similarly inscribed tomb on the edge of a high bluff is still used for Badawin burials. For the last few miles, before reaching the Police Post camping-ground at Imshash (Kedrij), sand succeeded the flints and we drove in the sunset between isolated orange peaks casting their long shadows on the flat desert. The night was spent on a sandy slope within earshot of the police, who sat till midnight in the coffee circle, each telling stories in turn, with a formality and style bred of an age-old tradition of language, phrasing, and drama. When our English assistant, an excellent Arabic speaker, finished his tale the whole circle clapped.

On the following day after driving through undulating country for a short time we saw an horizon of blue mountains, the Jebel Hausa. We made one stop after El Grinch at a mound of stones with Thamudic inscriptions. The mountains are fantastic sandstone pyramids, their tips bitten by the wind, rising sheer from the plain. One looked like a castle; another from a distance seemed to be covered with walls. Beyond, a great plain opened, almost surrounded by sandstone pinnacles, resembling the fantastic hills of the South Utah desert. The only way out of this enclave seemed to be a steep hill of alternate spiky stones in ridges, and soft sand. All four cars stuck; ours hit a rock and we thought the back axle had broken. When that was repaired and all the cars pushed up the hill, the baggage truck stuck six times in the sand. To move it farther seemed impossible and the expedition encamped for the night in the valley. Next day, abandoning everything but the largest passenger car and the Patrol truck, we drove up hill to a plateau, with signs of walls, some circle graves, and low blackish sandstone hills. On a large flat plain at the top of all was an extraordinary sight: stone houses partly standing to the second storey, with remains of plaster inside and out, and square doors and windows built in the Hauran style of architecture of the sixth to eighth centuries A.D.

We were not the first English visitors to this spot, for Gertrude Bell on her more easterly route to Hayil, was told in February 1914 by Muhammed Abu Tayyi, cousin to the great Sheikh Audeh, of a ruin in the hills to the west of her camp. In an unpublished diary she writes: "I could not say no, and leave a ruin behind me, so rather reluctantly we turned west again, rode for a couple of hours, and pitched our tents in Muhammed's encampment, near his big 'house.' Next day I rode off with two guides, five hours across the hills and found a ruin which was quite worth seeing. A sort of little Khan or a Khabra which had been walled round to form a birkeh. I made no doubt that it was a menzil on the road from Iza'ir to Taimah. There was a Cufic inscription dated, but alas! I could not make it out with certainty. Anyhow there it is, the only ruin in these parts, good squared stones and mortar brought from afar, and I have got it all down in my note books. We worked for two hours; it was necessary to hasten, and we got home in four hours. On the way out I had seen something else on a hill top which I must leave to those wiser than I to explain; a round chamber, beehive domed, of rude stones surrounded by a completely circular low wall, and yet further outside a row of upright stones enclosing the temenos. What can it be? An ancient high place? Some sort of sanctuary I make no doubt, and very

ancient. What do we know of ancient nomad faiths? Altogether it was a profitable day." [1]

Kilwa was known to a far earlier Arabian traveller, al-Mukaddasi [2] of the tenth century, who refers in his description of the lands of Islam to three roads from 'Amman to Medina used for the carriage of mails from Damascus during the rule of the Umaiyad Caliphs. In the rainy season the middle road from Damascus to Bayir was preferred; 54 kilometres for each of the three days' march. The ruins of Kilwa, 170 kilometres farther south, correspond (according to Musil) with the well of al-Gawla which was reached in four further marches of 43 kilometres a day. Here, says Mukaddasi, "are filled-in wells which are not kept cleaned out by the Bedouin because their water is supposed to be unwholesome."

The Frobenius expedition which succeeded ours in 1934–35 drove 195 kilometres from Kilwa to El Jafr and back for 125 litres of bad water per car.

Kilwa is the word for a monastic cell and derives from the Greek *Kellion* or *Kalyba*, the name for the daughter house of an Orthodox *Lavra* or monastery. The cells were sometimes grouped in a sort of village called a *sketa*.[3] At Kilwa the disintegrated stone structures, round, square, and oval, must have been the ruins of cells or hermitages. Some of them were about 20 feet long and they were aligned on an inner and an outer half square. A cross of an unusual type stands at the east angle,[4] and there is one complete door lintel left with a Kufic inscription and Maltese Cross.[5] The type of lettering was considered by the Domican Père Savignac of the École Biblique, Jerusalem, to resemble the script of about A.D. 1000, and the ground around was strewn with late Byzantine pottery. In the foreground are the three larger buildings of "good squared stones and mortar brought from afar," in one of which was the Kufic inscription studied by Gertrude Bell.

Our stay had to be a short one as we also had not found water. But the bleak landscape of small isolated rocky hills, black against a vast horizon, drew the expedition on. We walked a few hundred yards eastwards to a sandstone hill that looked almost artificial, and caught sight of built walls belonging to a lime-kiln. On a flat rock was a Thamudic inscription imposed upon a roughly outlined lizard, which in its turn hid all but the great horns of two earlier ibexes.[6] We noticed many more animals on the way up and took photographs, gradually becoming aware that some must be prehistoric—those that had no discoloration and merely showed a continuous black outline consisting of punched holes merged together. The Thamudic drawings, one thousand five hundred years old, were still a yellowish white. Our photographic films were almost used up, but in the bare half-hour, which was all that could be spared, a record was made sufficient to convince the Abbé Breuil, Professor Dorothy Garrod, and M. René Neuville of their prehistoric date.

[1] Extract from Gertrude Bell's MSS. diary, supplied by her sister, Lady Richmond.

[2] floruit A.D. 967–985. M. J. De Goeje. 'Ahsan,' p. 250. For a summary of this see A. Musil. 'Arabia Deserta.' Appendix VI, pp. 516–18. American Geographical Society. Oriental Explorations and Studies, No. 2.

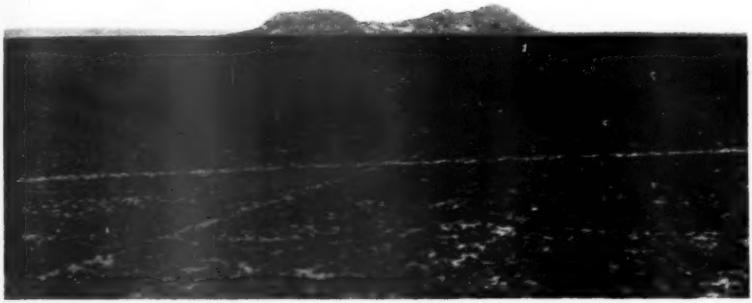
[3] Adrian Fortescue. 'The Orthodox Eastern Church,' p. 355.

[4] "Prehistoric rock-drawings in Transjordan," Fig. 4. George and Agnes Horsfield and Nelson Glueck. *Amer. J. Arch.* 37 (1933).

[5] *Ibid.* Fig. 5.

[6] Hans Rhotert. 'Transjordanien,' pl. 20.

Jebel Hausa, looking south



Mountains north of Imshash, looking south

Mountains north of Imshash, looking south

Looking south over Jebel Hausa

Two years later, when the last of the twelve German-Africa expeditions directed by the late Leo Frobenius spent six weeks at Kilwa, they found no rock-drawings as early as these on any other hill. They named this hill "Horsfieldberg." An excellent publication followed: 'Transjordanien,' by the leader of the expedition Hans Rhotert [1]; and as his book reached England only a few months before the war, its rarity in this country may excuse a short account.

Horsfieldberg was the centre of an area approximately 9 or 10 kilometres from north to south whose surface was strewn with Lower Palaeolithic implements. But on a platform adjoining its south side were artifacts found nowhere else in the area, and belonging to one single mesolithic industry contemporary with the earliest drawings on the rock and closely related to the pre-pottery culture of the oldest levels of Jericho,[2] which had not been excavated when Rhotert wrote. The raw material of almost all these tools came from a group of sandstone ridges capped with a thick layer of broken chert, found by the Frobenius expedition 3 or 4 kilometres north-east of the Horsfieldberg.

Most interesting of all the animal carvings is the rendering of a small dromedary (still the typical Arabian camel of to-day) poised in space behind a mesolithic ibex, the patina of both establishing their contemporary date (T.J., Pl. 15.2). To all but specialists a veil of secrecy has obscured the origin of the Arabian camel, who first appeared in literature in the reign of the Persian King Nabonidus in the sixth century B.C.[3] But geological expeditions in North America have brought to light its fossil bones in Pleistocene deposits when America and Asia formed one single continent.[4] In the Second Glaciation stage of the Middle Pleistocene the dromedary had migrated to Kashmir, where its fossil bones are deposited with those of the topmost Upper Siwalik fauna, in the company of Bos, hippo, and crocodiles,[5] and in the period of the oldest flake industry in India, the Cromerian.[6] From India it could gradually have reached Afghanistan, Persia, and Arabia.

Another still larger dromedary found at Kilwa by the Frobenius Expedition and shown by a beautiful drawing in 'Transjordanien' (Pl. 15.2, p. 224.1), is in the style of the best of the mesolithic ibexes and considered by Rhotert to be as ancient as the smaller camel. These Kilwa drawings of dromedaries must be the earliest known.

On the rocks of the 'Uweinat Oasis in the Libyan desert and on both sides of the Nile valley, carved at a time when the river was dry, prehistoric drawings of elephant, rhinoceros, hippopotamus, and giraffe are widely distributed. But the camel is absent, and first appears on rock drawings in Egypt in the Roman-Blemyan period of the third to fifth centuries A.D.[7] Kilwa therefore so

[1] See Review by Dorothy Garrod in *Man*, April 1939, pp. 61–3.

[2] *Ibid.*, p. 62, on "The Horsfieldberg Industry"; also J. Garstang, J. P. Droop, Joan Crowfoot, "Jericho: City and Necropolis." *Liv. Ann. Archaeol. Anthrop.*, 1935. Joan Crowfoot. "Notes on the flint implements of Jericho, 1936." *Idem.*, 1937.

[3] R. P. Dougherty. 'Nabonidus and Belshazzar,' p. 115, and CAH. I, p. 501.

[4] Lull. 'Organic Evolution,' 1917, p. 639.

[5] H. de Terra and T. T. Paterson. 'Studies on the Ice Age in India and Associated Human Cultures,' p. 266.

[6] *Ibid.*, p. 222.

[7] Hans. A. Winckler. 'Rock-drawings of Southern Upper Egypt,' I, 1938, p. 16.

far as is known at present, marks the extreme western limit reached by the mesolithic dromedary, as shown by the drawings made with the artifacts of an independent stone-age culture that penetrated west of the Jordan at Jericho during the close of the mesolithic period.

In this oldest group of drawings on the Horsfieldberg, ibexes take first place both in number and in execution. All, both large and small, are outlined in profile; some superimposed upon others, cutting without reverence into the superb curved horns of earlier beasts. Many in rapid motion are drawn with consummate skill. One falling on his knees in a death struggle, his head strained forward, every muscle taut, is a magnificent example. The most life-like is in rapid flight, his foreleg high in the air. Some have strange incomprehensible ovals behind their tails and before their heads (T.J., Pl. 13.2). Others pour blood from the mouth. The best of these is one of several sacrificial ibexes drawn with a sharp stone, his foreleg bent, the blood streaming from his lips, and on his back, perhaps, a tiny man, raising both arms to the sky in the attitude of an adorant. Rock-drawings of larger adorants in the same pose, worshipping a gigantic stone-age buffalo, an ox, a donkey, or the Sun Ram,[1] exist in the Sahara, in the Atlas Mountains, and in the Libyan desert; whilst a composite drawing on the Horsfieldberg of an ox, full face with giant horns, is superimposed upon a male and female ibex, associated with a larger but more stylized figure that may be another adorant.[2] Linked by a line to his hind leg is what looks like a hoof, but is not so; for circles attached by wavy lines to the hind legs of two ibexes show no such resemblance, and have as yet no meaning.

Another drawing of an ox in profile,[3] poorly photographed in shadow, was thought by Rhotert to be a wild cat. But it is possible that an accidental trick of lighting has entirely obliterated the lower horn and produced the semblance of two wild cats' ears out of the upper one. The tail is due to a more recent scratch, which seems to have a fortuitous junction with a crack in the stone above, parallel to the ox's back; moreover the legs look too long. Doubt also exists as to the oryx, seemingly so clear in the original photo, but doubtful in Rhotert's book. The goat was known in prehistoric Egypt,[4] and occurs, with large horns, on the Horsfieldberg (Transjordanien, Pl. 16); the ichneumon (T.J., Pl. 17.2), covering an earlier ibex horn, with a hare by his side, may be later and was noted in Egypt for destroying the eggs of the crocodile.

The classification of all these drawings is still premature. In what can only be described as a later group are some tiny engravings of ibexes, the smallest of them being lighter in colour and therefore of latest date (T.J., Pl. 17.3). A drawing of the plough (T.J., Pl. 23.2), the oldest agricultural implement, was grouped by Rhotert with similar drawings of ploughs from Sweden and Italy, possibly of the bronze-age period.

On the summit of el-Biyara, a table-mountain dominating Petra on the

[1] Frobenius. 'African Genesis,' Fig. 2, 1938.

[2] "Prehistoric Rock-Drawings in Transjordan," Pl. XL and XLI. *Amer. J. Arch.*, 37 (1933) and 'Transjordanien,' Pl. 19.

[3] 'Transjordanien,' Pl. 21.1, and "Prehistoric rock-drawings," Pl. XLV, 1.

[4] G. Caton-Thompson. 'The Badarian Civilization,' p. 40.

Hill with carvings, Horsfieldberg, lime-kiln in foreground

Kilwa, roofed building of the monastic period in architectural style of the Hauran

The lime-kiln from above

Dying ibex, Kilwa

Design from Kilwa

The lime-kiln from above

west, some skilled artist drew on the flat rock beneath his feet a peacock; head cocked, eye roaming, a little masterpiece but undateable. Unlike the drawings already mentioned, this one is unique in using interior lines, and is the colour of the rock itself. A school of drawings of the Thamudic period of the third to fifth centuries A.D., are almost white and by far the most plentiful throughout the Transjordan desert. Of particular interest is a lion of Sassanian type (T.J., Pl. 28.1, p. 223), its tail high in the air, hammered out on the cliff of Hadbet-el-Hamra, north of the Guweira flat and near water, where the tribes camped and wiled away their leisure drawing camels, ibexes, ostriches, and donkeys.

The Desert Patrol, about the year 1930, pitched a camp at the foot of Jebel Rumm, south of el-Guweira, the site during the Arab revolt of T. E. Lawrence's retreat and earthly paradise. Nearby in the valley was a large isolated smooth rock on which a peculiarly gifted Badawin soldier scratched a mounted camel at the gallop, the rider shooting at his enemy on foot. When a stone fort to guard the frontier between Transjordan and the Hedjaz superceded the tents, this rock was blasted for building material and the best of all the modern drawings destroyed. Close to where it was is a Minaean rock-cut inscription more than two thousand years old; and not far off are Nabataean and Thamudic inscriptions [1] carved above the spring in the mountain side where Lawrence and a Badawin seer philosophized as told in the 'Seven Pillars of Wisdom.'

Rock drawings of prehistoric ibexes pierced by darts [2] and illustrated in 'Transjordanien' raise the question of the practice of magic as an aid to the chase among aboriginal hunters and the primitive native of to-day. Light was thrown on this by Leo Frobenius, who published a first-hand experience of the magic beliefs of the pygmies from a hunting tribe in the Congo.[3] Much of Frobenius' work was devoted to trying to show that the Stone Age cultures of Spain flourished at the same time in North Africa. His twelfth and last expedition to Kilwa was organized to relate the Kilwa rock-drawings to those of the African continent.

[1] M. R. Savignac. "Le Sanctuaire d'Allat a Ruin." *Revue Biblique*, 1933 and 1934.
[2] 'Transjordanien,' Pl. 11.1 and 2, and Pl. 15.1 and 2.
[3] Leo Frobenius and D. C. Fox. 'Prehistoric rock-pictures in Europe and Asia. Museum of Modern Art. New York, 1937, p. 22.

THE ORIGIN OF THE CAROLINA BAYS

THE ORIGIN OF THE CAROLINA BAYS. By DOUGLAS JOHNSON. *New York: Columbia Press*, 1942. 9½×6 *inches;* xiv+342 *pages; illustrations and diagrams.* 30*s*

THIS book is No. 4 of the Columbia Geomorphic Studies and its author is Professor Douglas Johnson, editor of the series. The so-called "bays" are remarkable shallow depressions which occur apparently by the thousand on the Coastal Plain of South Carolina and extend northwards some way into North Carolina and southward just inside Georgia. They are in the main swampy depressions, though some are dry and a few have water in them, which may be encroached upon by the growth of vegetation or by wind-blown sand. The majority of the bays have a remarkably oval outline and are usually bordered by a rim of white or buff-coloured coarse sand. Many of them after the best timber has been cut down are "oval areas of dense young forest or of open forest in which scattered trees rise above a dense undergrowth. . . ."

"The central part of a forested bay is often a pond or lake of open water. Other bays contain lakes surrounded by open marsh or grassland; others are occupied wholly by marsh gasses; while some, especially small ones, may be dry and contain a central area of dark carbonaceous soil cultivated by the farmer."

"Where much water is present or dense undergrowth covers a peat bog, it is difficult to traverse the bays. From the slightly higher and drier rims of coarse sand, which often border the bays and which commonly support a growth of longleaf pine, one may look out over a dreary stretch of flat swampy lowland or into a dense swampy forest. But one usually hunts in vain for a path across either. As a rule, trails and roads make long detours around the sandy margin rather than traverse the treacherous surfaces of the depressions."

The picture of the bays conveyed in the quoted passages is reinforced by the liberal reproduction of excellent aerial photos, of which there are dozens. Many of them have been assembled into mosaics covering large areas, in one case over 150 square miles. Fig. 3, facing p. 12, is a particularly beautiful example showing a group of four oval bays all uniformly aligned in a north-west and south-east direction. One cannot help a feeling of envy of the facilities for obtaining these remarkable aerial photographs available in the U.S.A. which have placed a weapon of supreme importance at the disposal of those engaged in geographical and geological studies. It is to be hoped that energetic efforts will be made after the war to secure comparable facilities in this country.

The parallel alignment which is brought out so clearly in these photographs is one of the most striking features of the bays system. It has been shown that in the northern part of the area of abundant bays the average trend is almost exactly N.W.–S.E.; in the southern part of that area however the trend is uniformly more southerly (about N.N.W.–S.S.E.).

The details fully set out in Chapter IX indicate the characteristics of the bays that any theory of their mode of origin has to take into account. Although mainly oval or elliptical some are more pointed at one end usually the south-east; some are highly irregular, and there are all gradations between these and the regular ones. Many are asymmetric, the north-eastern margins being more strongly curved than the south-western. They vary in size from a few hundred feet up to some 3 or 4 miles in their longest diameter. Oval craters while abundant in parts of the Coastal Plain are apparently absent from the Piedmont and other Appalachian provinces. The basins descend below the level of the

surrounding plain though they are very shallow in relation to their great size; they give the impression that they have been caused by the removal of some of the material of the Coastal Plain deposits.

Large numbers are bordered by rims of sand which is somewhat coarser and lighter in colour than most of the deposits on which they rest. The sand rims occur in general round the south-east end extending thence partially round the sides; exceptionally they occur at the opposite end. They may be single or multiple, and in all cases they rise to only a few feet above the surrounding plain; their inner side facing the bays may be steeper than the outside. Their total bulk is relatively small. Besides being composed of lighter coloured coarser sand than the underlying deposits, their base is sharply defined. They contain no obvious rock fragments from the formations below which are wholly undisturbed. Many of the bays have channels draining into or out of them.

The Coastal Plain deposits of Cretaceous and Tertiary age are exceedingly variable: lenses of sand and gravel alternate with one another and pass into clay or other impervious beds. The immediate surface is mainly covered by a considerable thickness of loose sand. After it was raised out of the sea the Plain had a general slope to the south-east, but it is stated that a broad low anticline trending N.W–S.E. through the Cape Fear area of North Carolina brings Cretaceous beds nearer the surface than to the north and south. This probably has the effect of swinging the strike of the formations into a direction more nearly E.N.E. on its south side.

A part of the Coastal Plain in which there are numerous bays shows distinct shallow straight or curving ridges and swales which are interpreted as beach ridges formed when the sea was receding past that area during the general emergence of the Plain. The author draws the important conclusion from the evidence that the bays were formed after the beach ridges, and their initiation belongs therefore to a late phase in the history of the emerged Coastal Plain.

Many suggestions have been tentatively offered in explanation of these remarkable features. They were regarded as the result of submarine scour, or pits on the floor of a shallow sea; or as drowned valleys which had been repeatedly blocked by the growth of bars and spits. All such explanations are definitely disproved by the observation that they were formed after the shoreline had retreated past the area. They were also attributed to wind erosion, but the hypothesis which appealed to the popular imagination and as it were put these features on the map was the so-called "meteoritic hypothesis." This attributed their formation to direct or grazing impact on the area of a swarm of meteorites. These hypotheses were confronted in turn with the special characteristics of the bays which have been summarized above and the inadequacy of all of them is satisfactorily established.

In the course of demolishing the meteoritic hypothesis some interesting information is presented on the features which are attributable to undoubted craters of meteoric origin. The author would have been reinforced in his views of the characteristics of craters of explosive origin if he had had an opportunity of visiting various areas in Britain during the last few years. This hypothesis has left an unfortunate residue: the author refers habitually to these depressions or basins as craters, thus risking some confusion with a mode of origin which he has convincingly refuted.

We are left with the explanation which the author offers; this is termed the Hypothesis of Complex Origin which is short for "the artesian-solution-lacustrine-aeolian hypothesis." According to this hypothesis the essential part in their formation was played by solution accompanying the movement of

underground water which gave rise to the basins. Lacustrine action trimmed their margins to their present forms and wind action is responsible mainly for the sand rims.

The essential features of this hypothesis can be stated very briefly. When the Coastal Plain emerged from the sea its surface was, as now, covered with sands, in part probably of marine origin and in part the residues of surface weathering. Rain falling on the emerged area gave rise to surface streams and to an underground flow from the higher towards the lower parts of the Plain. The former were directed by the general slope of the region though controlled in detail by minor irregularities. The underground movement was likewise determined in a measure by the general slope of the Plain, but at deeper levels the main control was exercised by the low prevailing dip of the Cretaceous or Tertiary formations and their variable constitution.

The essential element of the hypothesis is that the underground waters emerged at a very large number of points as "artesian springs." Artesian is used in the sense that the water rose up to, or in some cases above, the surface as boiling- or fountain-springs. It is not necessary to follow the author in his ingenious explanation of the manner in which the position and strength of these springs were controlled by the varying relative strength of the subsurface and deeper-seated flows.

These innumerable springs emerging at the surface of the undissected or very slightly incised plain caused solution of the materials through which they passed. It is shown in some detail that most of the formations, of whatever age, which underlie the surface contain some proportion of soluble ingredients such as limestones, marls, or shelly sands. In consequence of their removal large numbers of lakes were established on the surface. The elongation of these in the direction of the prevailing surface-slope or dip is attributed to variations in the relative strength of subsurface and deep-seated flows or to migration by solution or otherwise of the point at which the latter come through towards the surface. The almost uniform alignment of the basins is thus brought into relation with the general slope of the plain and the prevailing dip of the underlying formations. The change in alignment in the southern part of the area is suggested to be due to a change in the direction of dip of the latter.

Having established these basins in the surface sands of the Plain their enlargement would follow by the sliding of loose sands from the margin towards the centre where the springs emerged; some of the sand may actually have been withdrawn into underground solution cavities and channels.

It is pointed out that by the mode of origin sketched above it does not follow that all the depressions would have the regular outlines of the oval bays but that others of irregular outlines may be formed. It is shown in fact that there is every gradation between regular and irregular forms pointing to a community of origin. If for example a resistant formation occurs at a small depth below the surface this will restrict enlargement of the primary solution-depression by the withdrawal or slumping of the sand around the margins. Large numbers of sinkholes are found in association with the bays, and many of these have very steep sides like the sinkholes or swallow holes so familiar in the chalk and Carboniferous limestone areas of this country.

The part played by waves and currents in modifying and enlarging the margins of the lakes is a well understood process which is discussed at some length. Beaches, bars, and spits are the main result and most of the multiple rims are due to their operation. The position of the sand rims due to aeolian action seems to be controlled in the main by the direction of the prevailing winds in the area.

While these lakes were being developed, and their outlines determined, dissection of the Coastal Plain by surface streams was proceeding and a general lowering of the level of ground water led to diversion of most of the flow into neighbouring stream channels. This caused the slowing down and ultimately the almost complete cessation of bay formation. The lakes became marshy hollows or peat bogs and finally many of them became dry enough to support a heavy tree and shrub covering.

Each aspect of the process: artesian action, solution, waves and currents in the lakes, and wind action round their margins is examined in turn and a wealth of detailed evidence is adduced in support of their effectiveness.

It would be very interesting to know why these basins do not occur farther north in North Carolina and in Virginia where the Coastal Plain deposits and their surface covering are to all appearances very similar to those of the bays country.

Those who are familiar with the Breckland meres of Norfolk will be reminded frequently of many points of similarity between the meres and the Carolina bays. Fortunately no one in this country has suggested a meteoritic hypothesis to account for them. The view has always prevailed that they are due to solution of the chalk, which underlies at small depth either Boulder clay or sands derived from its leaching; which gives rise to the characteristic features of the Breckland. Here too the meres are associated with a great number of sinkholes, some remarkably regular like the Devil's Punch Bowl, others irregular in outline and steep-sided. Some of the meres tend to the elongated or oval form and one is circular, but they lack the sand rims of the bays possibly owing to their small size and the protective cover of vegetation.

Owing to the great fluctuations of the water in these meres and their occasional drying up evidence of the character of their floors can be obtained which tends to confirm some aspects of Professor Johnson's hypothesis. In several of them there are obvious channels in the floor by which water comes in or goes out. That they have not acquired as regular a form as the bays is probably due to the presence of the resistant chalk at a small depth below the sand cover at the surface. In other respects it seems likely that the explanation offered in this book of the bays of Carolina will serve in large measure for the Breckland meres.

O. T. JONES.

REVIEWS

ASIA

CHINA, THE FAR EAST AND THE FUTURE. By GEORGE W. KEETON. *London: Jonathan Cape*, 1943. 9×6 *inches; 296 pages; sketch-maps.* 15*s*

Dr. Keeton has written a concise account of the Far East problem which will be of interest to all concerned with the Pacific settlement. The book falls into three sections. In the first he discusses the rise of Chinese nationalism and the slow collapse of the old imperial China. The Manchu emperors gradually lost the virile qualities of their less civilized predecessors. An emperor in 1898 however realized the possible implications of the economic and political pressure from the western powers when he said, "the Chinese rest contentedly in the belief that the old order of things will suffice for these dangerous times and in the end will become the easy prey of outsiders" (p. 58). Chinese society, traditionally

conservative, did not show those quick powers of adaptation possessed by the Japanese. A rude shock was administered by the Sino-Japanese war of 1894–95, but China was unwilling to be hurried.

Japan, skilfully arousing admiration in the west, was at the same time working out those schemes of conquest now familiar to the world. Russia cast covetous eyes on Manchuria and lost her war with Japan, largely because her navy was crippled by an attack without declaration of war. Meanwhile, the far-seeing elements in the west became more alarmed at the spectacle of China rent by civil war and economic problems. But Sun Yat Sen laid the foundations of modern China and did much to make possible the unity so apparent to-day.

In the second part Dr. Keeton shows Russia and Japan in the Far East ready to destroy China. The Washington Conference promised a permanent settlement and succeeded temporarily because of the great naval strength of Britain and the United States and the war weariness of Japan after her prolonged and costly intervention in eastern Siberia in support of the white Russians. Japan had lost prestige abroad and at home liberal forces became dominant. She kept the peace for nine years from 1922 and Washington was an American diplomatic triumph which postponed a major war in the Pacific for nearly twenty years. It was only a postponement however and Japan, reproducing the "patience exhausted" theme of Napoleon, Mussolini, and Hitler, began the China Incident in 1937.

The final phase of Japan's adventures in world conquest began on 7 December 1941. This phase of the second world war is treated by Dr. Keeton up to the summer of 1942 in the third part of the book. "There can be no end to the Pacific war until an allied army occupies Tokyo and dispels the universally accepted Japanese legend that they are superior to all other peoples. . . . In facing Japan the Allies are facing a first-class power, excellently prepared. They are also reaping the consequences of thirty years of neglect of the Far East problem. Foresight of no very remarkable quality would have predicted this war, but to avert it has proved impossible because of the lack of a common policy amongst those states which were threatened by Japanese aggression" (p. 266).

Dr. Keeton's views on the future of the Far East may be left to the judgement of the reader. Prophecies frequently fade in the light of a new day. The prospect for Japan is bleaker even than many realize, but China is re-born. The book has a good index but is lacking in references. The maps however are inferior and not well placed. T. W. F.

NORTH AMERICA

THE PENNSYLVANIA GERMANS. Edited by RALPH WOOD. *Princeton, N.J.: Univ. Press*, 1942. (*Oxford University Press*). 9×6 *inches*; x+300 *pages; sketch-map*. 20*s*

The settlers with whom this series of essays deal came originally from the Palatinate: the editor therefore prefers to call them Pennsylvania Germans, rather than Pennsylvania Dutch, the name by which they have generally been known. The epithet Dutch arose from a misinterpretation, but in so far as it implies an affinity with the Netherlands it emphasizes the Low German origin of their dialect. These settlements in eastern Pennsylvania, dating from the beginning of the eighteenth century, have preserved their individuality to a high degree largely owing to religious conservatism and to devotion to farming. The nature of the land they occupied in the New World closely resembled that

of their homes in the old, good limestone country. Here they could apply the agricultural technique with which they were acquainted, and, unlike the majority of European immigrants, establish an intensive system of farming aiming at self-sufficient units. As Benjamin Franklin expressed it, in Europe land was scarce and labour plentiful; in America it was land that was plentiful and labour scarce. The Pennsylvania Germans were not primarily pioneers; to a great extent they took over and improved land abandoned by the westward movement of more restless settlers. They remain to-day noted for a high standard of farming and of farm buildings, and owe much of their success to their attention to meadows and grass. Their dialect is a branch of Low German most nearly allied to that of the eastern Rhenish Palatinate: it retains that connection in its syntax but its vocabulary has been increasingly influenced by English. During the last century their literary German died and has in recent years been replaced by a dialect literature, with a school of writers who enjoy much popularity. Much of this book is concerned with the history and present position of German and dialect literature, and there is some overlapping between the various chapters. The general reader will probably find more interest in the relationship between this independent-minded community and the government, their attempt to practice non-resistance, and their contribution to the general development of national life. It is perhaps inevitable that most of the writers are on the defensive and slightly apologetic, but as the editor remarks, a people of their temperament are unlikely to have leanings towards State regimentation of the individual and the community.

THE LETTERS OF JOHN McLOUGHLIN FROM FORT VANcouver to the Governor and Committee. First Series, 1825–38. Edited by E. E. RICH with an introduction by W. K. LAMB. (Publication of the Champlain Society, Hudson's Bay Company Series, IV.) *Toronto: Champlain Society*, 1941. 10×7 *inches;* cxxv+374 *pages; frontispiece and map*

This book is the fourth volume of the Hudson's Bay Company Series, published by the Champlain Society. It consists in the main of John McLoughlin's letters written from Fort Vancouver between 1825 and 1838 to the Governor and Committee of the Hudson's Bay Company. John McLoughlin was Chief Factor of the Company in the Columbia district, and his official letters throw much light on the history of the Company's activities on the Pacific coast during the nineteenth century. The complete text of every letter in the Company's possession which McLoughlin wrote during this period has been printed in the volume. In 1838 McLoughlin went to England on leave and returned later to the Columbia. It is stated in the preface that the Champlain Society will eventually publish a second volume of McLoughlin's letters covering the period between 1838 and the end of his service with the Company in 1846.

The letters are full of the many problems of pioneer life with which McLoughlin had to deal: "hostile Indians, obstructive Russians and pioneering Americans, with the problems of agricultural settlement and of missionary enterprise, with the balance between exploitation and conservation of fur-bearing animals, with fever, shipping, timber and salmon." Of especial interest are the signs of growing American interest in Oregon; the arrival of Wyeth in 1832 and again in 1834, marked the extension of the activities of Americans from the Snake country to the valley of the Columbia. The fear that increase of settlement would imperil the fur trade is often evident in the letters.

McLoughlin's character comes out clearly from the letters. He became increasingly intractable and quarrelsome as time went on; yet this trait was blended with much kindliness. He was an able but difficult man, not easy to

serve or to employ. McLoughlin's quarrels with the Rev. Herbert Beaver, sent out by the Company as Chaplain and Missionary in 1836, make amusing reading. The trader Ogden remarked on the reverend gentleman's "very appropriate name for the fur trade," but Beaver showed himself totally incapable of adapting himself to the rough life of a frontier trading post; his complaints about the life never ended and McLoughlin actually came to blows with him.

The text of the letters is preceded by a valuable introduction by Dr. W. Kaye Lamb, Librarian of the University of British Columbia. This describes the history of the Columbia district before 1825, the early career of McLoughlin, and summarizes his work in the district during the period covered by the letters. An appendix gives useful biographies of many of the more important persons who figure in the letters. A portrait of McLoughlin and a reproduction of part of Arrowsmith's map of North America in 1857 are the only illustrations in the volume. E. W. G.

AUSTRALASIA AND PACIFIC

FIJI: LITTLE INDIA OF THE PACIFIC. By JOHN W. COULTER. *Chicago: Univ. Press*, 1942 (*Cambridge Univ. Press*). 9×6 *inches;* xiv+156 *pages; sketch-maps.* $2.00

For the study of native peoples in relation to modern civilization, developments in Fiji are of particular interest; not only are the Fijians in the process of adjusting their traditional ways to western commercial and political ideas, but they have to come to terms with a large alien body of Indian immigrants, who compete with them for the available agricultural land. In his monograph, based upon research in the islands, Doctor Coulter provides an impartial summary of the contrasts between the mode of living of Indian and Fijian, their relations to the colonial administration, and the policy which is being pursued to reconcile their conflicting claims. He describes clearly the breakdown of native communal life in the present conditions and the difficulties encountered in transforming a communal landowning and social organization into a community of peasant proprietors, to many of whom modern economic incentives do not appeal. Many natives who avail themselves of the opportunity to abandon their clan do so only to escape the obligations of communal life, without wholeheartedly accepting the new conditions. A further problem is to counter the demoralization which may ensue from the aimless expenditure of rents received from alienated land.

The progress of the Indian on the other hand has been from indentured labourer to tenant farmer. With their long farming experience, the Indians have established themselves with much success, though they have not been able to shake off the usurer, and the problem of the renewal of leases and security of tenure present difficulties. They have also shown themselves to be more adaptable and keener in finding occupation outside farming. The future of the Fijians therefore whose numbers are growing less rapidly, is uncertain. To segregate them in less accessible areas under their traditional organization would probably mean ultimate extinction, even if such a policy were now practicable. They must be encouraged to develop their land, not necessarily for commercial production, as is recognized in the educational experiments now being carried out.

This book is clear in arrangement and style: the sketch-maps might have been improved, and there is one confusing slip on p. 17, where the increase of the Indian population is stated to be at the rate of 26 per cent. yearly.

CARTOGRAPHY

A DESCRIPTIVE LIST OF THE PRINTED MAPS OF CHESHIRE, 1577–1900. (Remains historical and literary connected with the Palatine counties of Lancaster and Chester, vol. 106. N.S.) *Manchester: for the Chetham Soc.*, 1942. $8\frac{1}{2} \times 6\frac{1}{2}$ *inches;* xvi+220 *pages; illustrations.* (*Annual subscription* £1)

With unabated industry Mr. Harold Whitaker is continuing his valuable contributions to the series of County-map catalogues started by Sir George Fordham, Mr. Chubb, and a few others, to which he himself had previously added volumes on the maps of Yorkshire and Lancashire, reviewed in the *Journal* for May 1934 and May 1939 respectively. Mr. Whitaker's methods follow fairly closely, though with a few minor improvements, those of his immediate predecessor, Mr. Chubb, and his volumes are models of thoroughness. In their preparation he had made himself master of the general bibliography of county maps, besides bringing together an important collection of county atlases; so that, in continuing the series by the volume for Cheshire, most of the material was ready to his hand. All such catalogues must show a certain similarity, since a large proportion of the items form part of atlases dealing with England and Wales as a whole, and detailed comment on the present volume is hardly called for. Of independent maps of Cheshire the first on a fairly large scale (roughly a mile to an inch) was that of P. P. Burdett, in four sheets, brought out in 1777, which gives many details not found on previous maps, but curiously repeats the error of longitude introduced by Bowen in 1752.

From the quite early period Cheshire can show an independent effort to some extent supplementing Saxton's work, that of the "Herald" William Smith, first compiled in 1585, though it long remained in MS. only. Mr. Whitaker does not profess to deal with MS. maps, but as Smith's map was at last printed in 1656, in the 'Vale Royal' published by Daniel King, brief reference is made to the MS. preserved in the British Museum. Mr. Whitaker rightly puts this down as probably a later copy, but he does not seem aware that a version, apparently the original, of the map exists at the Bodleian, dated 1585. Smith was a native of Cheshire and his influence is also to be traced in Speed's map of the county, one of the few in which Speed recorded his obligations to other map-makers than Saxton. Mr. Whitaker's introduction gives a concise sketch of the rise and progress of British topography as shown by county maps, but this is largely a repetition of what he had said in his earlier volumes and is not quite brought up to date, for instance the reference to John Norden's efforts is incomplete in view of recent finds. The volume is attractively produced in the same style as the previous list of Lancashire maps, both being publications of the Chetham Society. It is illustrated by fourteen reproductions of old maps.

To all specially interested in maps of Cheshire, Mr. Whitaker's catalogue will be indispensable, and one is pleased to learn that he is now at work on a similar volume on the maps of Northumberland, to be followed, he hopes, by one for Durham. E. H.

GENERAL

THE FISH GATE. By MICHAEL GRAHAM. *London: Faber and Faber*, 1943. $8\frac{1}{2} \times 5\frac{1}{2}$ *inches;* 196 *pages; illustrations and diagrams.* 10*s* 6*d*

The title is a symbol of the author's hope that the principles involved in the study of the fishing industry may not be without application to the economics of modern industry as a whole; the fact that the cry from the Fish Gate, one

of the entrances to Jerusalem, was such as deserved the prophet's special mention makes a good analogy. The author deals with his subject with great authority; all the descriptions are clear and graphic, and the book is full of interest.

The problems of the various sections of the industry: inshore fishermen, drifters, and trawlers, are different. The inshore fisherman suffers because he often works in competition with the steam trawlers, and because he is more likely to suffer from the reduction of the stocks of fish in the sea: if a fish population based on an offshore ground is reduced by half, the inshore fisherman, working in the peripheral region, is likely to get none at all. His task became increasingly difficult in pre-war years: he was obliged to seek new and more difficult grounds, and received less and less return for his increasing outlay and labour.

The herring fishermen in pre-war years could catch more fish than they could sell, and their problem was the loss of overseas markets. The landings of herring fell from about half a million tons in 1913 to less than a third of that weight in 1933; the British housewife was using less than she did, but the salted herrings exported to the Baltic region in barrels were always the mainstay of the industry. The author suggests that home consumption could be increased by some general attempt to improve the quality of the lightly cured products, but makes it clear that the industry cannot rise to its former level without the help of foreign trade agreements.

The so-called white fish, cod, haddock, plaice, and many others, caught on or near the sea bottom by trawlers, constituted about three-quarters of the fish landed in the British Isles before the war. One section of the industry fished in the Arctic, as far away as Iceland, Spitzbergen, and Nova Zembla, and the other on near and middle grounds, mainly in the North Sea. Arctic trawling, like herring fishing, outran the market: profits were high and very tempting at first, but it was not long before the increased activity forced prices down to an uneconomical level. It was greatly to the credit of the industry that stabilization was brought about by the owners' cooperation; the catches were limited to a predetermined weight, and incidentally the quality of the fish was improved by the greater hold-space available. The fish was, at best, slightly stale when it was landed, and Mr. Graham suggests that further attempts to improve the quality would promote increased sales.

The fish taken on the nearer fishing grounds always found a ready market, and the distress in this section of the industry was due to lack of fish caused by overfishing, which had reduced the stock of fish to an unproductive level. Technical progress was made in many ways: more elaborate gear proved more efficient, and with heavier gear rough grounds could be fished as well as smooth; but the fishing became less profitable as the gear became more expensive and more troublesome to use. For a time the new inventions and more vigorous fishing allowed the total weight of fish landed to be maintained at a high level, but each trawler was catching less, and the industry was entering a state of "chronic unprofitableness."

As a result of recent international research it is possible for the staff of a fisheries laboratory, equipped with a research vessel and in close touch with similar laboratories in neighbouring countries, to decide as a result of their observations what weight of fish could be caught without impairing the stock left in the sea; and international agreement and control based on such work offers the prospect of an optimum catch which would yield the maximum steady income; immature fish would be allowed to grow to a size at which their capture would be economical. The improvement which followed the years of reduced

fishing in the war of 1914–18 demonstrated the fish population's great powers of recovery, and the fish are now again increasing in number and size. The importance of Mr. Graham's book is increased by its appearance at a time when preparation can still be made to prevent the regrettable overfishing which followed the war of 1914–18.

"Information rather than advocacy" is the avowed purpose of the book, and all aspects of science and practice are justly dealt with. The author has a good word for the "middlemen" who, in the fishing industry more than any other, have real work to do to insure that the product can be sold in good condition. The word "schoolman," frequently used, is an unworthy description of the average member of a fisheries research staff, who is much more modern and practical than the word implies; the book itself could not have been written ten years ago. A minor criticism can be made about the statement, on p. 121, that winds help to separate the light surface water from the heavier deep water; it is true that wind currents are largely confined to the light surface layer, and that light and moderate winds may help to concentrate the difference between the two layers into a very thin stratum, but in general the effect of wind is to reduce the difference and to assist the mixing of the layers. G. E. R. D.

SYSTEMATICS AND THE ORIGIN OF SPECIES FROM THE VIEWpoint of a Zoologist. By ERNST MAYR. *New York: Columbia Univ. Press*, 1942. 9×6 *inches;* xiv+334 *pages; diagrams.* 26*s* 6*d*

Systematic Zoology from the time of Linnaeus up to nearly the end of the last century was occupied in naming newly discovered forms of animal life and arranging and classifying all these forms according to their similarities into various categories such as species, genera, and families. During the last fifty years several new conceptions have arisen, and the change from a static to a dynamic idea has taken place. This has largely come to pass by the realization that the species formerly regarded as a fixed and unchanging unit is, like all life, variable especially geographically.

Such geographical variation was first recognized as of importance by ornithologists. This is perhaps due to the fact that the bird life of the world has been more intensively studied than that of any other group, and it is primarily on examples taken from the systematic study of ornithology that the present volume is based.

The author, Dr. E. Mayr, has had much experience in the field, especially in New Guinea and the Pacific Islands, and now holds a position as one of the Assistants in the Department of Ornithology in the American Museum of Natural History in New York. He is thus fully qualified by training and experience to deal with the principles of what has been called the New Systematics. After two introductory chapters on the methods and principles of systematics the author proceeds to discuss geographic variation and it is on this that he relies for his explanation of the basis for the formation of new species. It is now becoming more evident that species descend from groups of individuals that have become separated from each other through physical or biological barriers and which then diverge during the period of isolation. This divergence is frequently in regard to structural as well as genetic characters so that when, at a later stage, the groups again come in contact with one another they do not interbreed and thus new species arise.

It is this thesis, the formation of new species by geographical isolation, which Dr. Mayr has elaborated in the present volume. He has presented his facts and conclusions logically and clearly in a manner which may be followed very easily by the ordinary reader. He has embodied in his discussion many of the dis-

coveries of the new departments of biology: Genetics, Experimental Biology, Biochemistry, and Pathology, and their bearings on this problem.

There can be little doubt that this explanation of the origin of species applies very aptly to the higher groups in the zoological sequence especially to the Mammals and Birds and also perhaps among the great group of the Insects. But there are many forms of life especially among the marine and more simple groups such as the Protozoa in which this solution seems less satisfactory. Dr. Mayr appears to be fully aware of many of these difficulties in the application of his ideas and discusses many of the problems at considerable length. A perusal of the volume will not fail to be of value both to professional zoologists as well as to those who take merely an interest in the progress of biological science. For those engaged in the study of systematic zoology it will be undoubtedly of great value as a text-book for a long time.

The volume is produced by the Columbia University Press of New York and is a pleasure to read and handle in these times of skimpy and unattractive book-production. It is illustrated by a series of diagrams and maps and has the advantage of a sympathetic preface by the well-known writer and student of Drosophila genetics, Professor Th. Dobzhansky of California. W. L. S.

HADDON THE HEAD-HUNTER: a short sketch of the life of A. C. Haddon. By A. HINGSTON QUIGGIN. *Cambridge: Univ. Press*, 1942. $7\frac{1}{2} \times 5$ *inches*; xii + 170 *pages; illustrations.* 7*s* 6*d*

In the preface to this modest but eminently readable biography, terse and unadorned as the man himself would have liked it to be, the author, one of his oldest and most faithful pupils, says truly, "the life history of Alfred Cort Haddon is, to a great extent, the life history of modern Anthropology." As is well known, Haddon was, from the point of view of science, a self-taught man. Born of a long line of ardently Nonconformist business forebears, Haddon struck out on his own, first with a passion for zoology that finally led him to occupy the Chair of Zoology at Dublin, and then into what were at that time the uncharted seas of Anthropology.

His capacity for work and for untiring good fellowship were only equalled by his almost permanent lack of funds, and by the dogged opposition to what he termed the Cinderella of the Sciences which he espoused and so largely helped to create. Having thrown up his professorship at Dublin to follow his life's call, he must be one of the few men of world-wide repute who was never rewarded by anything higher than a Readership in the academic world; his own pupils and their pupils now fill positions of recognized distinction.

The story goes that, on returning from his first expedition to Torres Straits in 1888 as a marine biologist and being invited to lecture to a distinguished body including the great figures of theoretical anthropology of his day, it was discovered that he was the only one present who had seen a real live "native" in his natural surroundings. However this may be, he did not then rest until he had achieved the great enterprise that will always be associated with his name, the "Cambridge Expedition to Torres Straits and New Guinea," in 1888–89, during the course of which all but one of the eminent men of science he took with him—Rivers, Myers, McDougall, Ray, Wilkin, and Seligman—became converted for life to this new branch of the Study of Man. The published results of the Expedition are well known under the name of The Torres Straits Reports, six monumental volumes which took thirty-four years to publish, volume I appearing last in 1935.

One of the many humorous touches in this biography is the record of Haddon's first meeting, during this expedition, with the primitive kinship

regulation known as sister-exchange marriage, which he describes as "sister-exchange in the raw, like a case not unknown to us," referring to his own marriage with Fanny Rose, sister of Holland Rose who married Haddon's sister Laura. Nor does the biographer omit constant tribute to Fanny Haddon's staunch courage and support of her husband through sixty odd years of their joint hard work, accomplished with indomitable spirit, and in the rearing of their three children through all the vicissitudes of his changing and always financially precarious fortunes. Despite these their house in Cambridge gave constant welcome, as was well known by the reviewer and innumerable others who owe their careers to Haddon.

Haddon's unfailing good humour and helpfulness to all, as well as his untiring energy up to the last, were proverbial, and it was a real inspiration to watch him beautifully rounding off his active life by the completion, one after the other, of all his main projects, finishing his last work on 'Smoking and tobacco pipes in New Guinea' only a short time before his death.

These facts and many more are admirably set out by Mrs. Quiggin in her excellent work, to which is appended a bibliography of two hundred and twenty items Haddon had written (selected from six hundred of which record has been kept), including sixteen separate books, forming only part of a life's work of which the most outstanding feature was his inspiring personality and, among his greatest titles to fame, the number of first-class workers whom he stimulated to take the field and carry on what he had begun. J. L.

THE STATESMAN'S YEAR-BOOK. Statistical and historical annual of the States of the world. 1943. Edited by M. EPSTEIN. *London: Macmillan*, 1943. 7×5 *inches;* xxxii+1470 *pages; maps.* 30*s*

The 'Statesman's Year-book 1943,' the eightieth annual volume, is unchanged in appearance and size. The text is brought up to date with the latest available statistics, which, the editor remarks, are surprisingly plentiful despite war conditions. Books of importance published in the last year have also been added to the bibliographies.

Two folding maps in colour show the Alaskan Highway with road connections, and strategic railways in the U.S.S.R. and Persia. The latter indicates as recently constructed several lines which have previously appeared on maps as projected. They include one from the Dvina to the Kara Sea, and another leaving the Trans-Siberian at Nizhne Udinsk, running north of Lake Baikal to the Sea of Japan at Port Soviet. This place-name incidentally is sometimes rendered as Soviet Harbour, which is a closer approach to the Russian, Sovetskaya Gavan. It is not clear what is meant by "recently," as the Turkistan–Siberian railway is indicated thus, though some other post-revolutionary lines are not.

GOLD FROM THE SEA: the epic story of the *Niagara's* bullion. By JAMES A. TAYLOR. *London: G. G. Harrap*, 1943. 8×5½ *inches; 200 pages; illustrations.* 10*s* 6*d*

The loss of the R.M.S. *Niagara* in June 1940, some 28 miles out from Auckland, caused more comment than that of many other ships, since it was not at first believed possible that there could have been enemy mines in the area. The comment however was nothing to that which would have occurred had it been known that the ship was carrying some two and a half million pounds worth of gold, destined to pay for war supplies from America before the days of lease-lend. This news was released only when it could be countered with the more reassuring news that 94 per cent. of the gold had been recovered. This was the most difficult and important work of salvage so far undertaken; the Italian

recovery of the *Egypt's* gold was bettered in every detail. Undoubtedly the United Salvage Syndicate of Sidney gained by the Italians' experience, but whereas much time was given to the *Egypt's* salvage, the *Niagara's* gold had to be raised as rapidly as possible; the ship lay in the middle of an unswept minefield; off a treacherous coast instead of in the Bay of Biscay; on its side instead of upright, and moreover 50 feet deeper. In spite of these the *Niagara's* salvage was completed in eleven months as against six years, at a cost of about one-sixth, and with a greater proportion of gold recovered. Moreover the observation bell had to be built at Sidney; the ship, the *Clayton*, although dubbed "the ship no mine could sink," had to be rescued from a salvage dump for the job, and war-time shortages of materials hampered the work considerably. The story of this remarkable feat has been written by James Taylor, the only reporter allowed on board who arrived shortly before the first gold was raised and remained throughout the rest of the time, even making a trip in the observation bell himself. He tells the story vividly and with humour. D. R. C.

OUR BIRMINGHAM: The Birmingham of our forefathers and the Birmingham of our grandsons. *Birmingham: Cadbury, Bros.* (*London: Univ. Press*), 1943. 9×7 *inches; 52 pages; illustrations, maps, and diagrams.* 1*s*

Messrs. Cadbury have produced this small book to "stimulate the interest of the young people of Birmingham in the past growth of their city and particularly in its future development." The history of Birmingham is sketched from the days of the Manor of Birmingham in Anglo-Saxon times to the present city, the second largest in Britain. Emphasis is given to housing conditions and the growth of the city, there are many sketch-maps, diagrams, and photographs. These are mainly interesting and well chosen. The book makes no claim to giving any contribution to plans for Birmingham: it is presumably intended for schoolchildren and questions and suggestions for further work are given at the end of each section under the title Organized Work. Birmingham forms a good subject for the study of planning, there is much to do, but more has already been done than in most other cities in England.

THE MONTHLY RECORD

CONFERENCE ON THE FUTURE OF ARCHAEOLOGY

The University of London Institute of Archaeology convened a "Conference on the Future of Archaeology" in London from 6 to 8 August 1943. The Programme declared that it was "not proposed that the Conference should take steps which might commit archaeologists to a definite line of policy since, in the absence of so many archaeological workers on national service," the Conference could not "be fully representative." Nevertheless the interest of the large and distinguished gathering clearly centred on the planning proposals advanced, and the numerous caveats which these aroused.

After an opening address by Dr. Grahame Clark, the Conference considered the future of archaeological discovery at home. Mr. Christopher Hawkes advocated total, rather than selective, excavations, so that whole cultures might be described and presented to the masses, *e.g.* by means of films. Mr. I. A. Richmond held that Romano-British religion had been neglected, and urged that micro-botany, metallurgy, and conchology should be drawn upon more systematically in the archaeologist's task. Mr. T. D. Kendrick believed stained glass to deserve more attention; current reproductions were almost useless, but colour prints from Kodachrome film opened new perspectives. He also stressed the study of early English ceramics, and monuments and churches. Properly edited guide-books should carry the archaeologist's study up to the present. In the discussion, Sir John Myres commended the guide-books issued locally for annual meetings of the British Association for the Advancement of Science, and it was mentioned that the Historical Association now supplies printed advice for guide-book writers. Mrs. Hawkes linked the stimulation through guide-books of local interest in traditions, which was said to be waning, with the Government's desire to attract tourists after the war. Dr. Margaret Murray feared that much destruction was incidental to aerodrome building, but a member of the Department of Public Works believed that the precautions taken were usually adequate.

After an address by Professor Gordon Childe on "the Unity of Archaeology," the future of discovery overseas was authoritatively charted by Sir John Myres, Dr. C. F. A. Schaeffer (French National Museum), Dr. Ernest Mackay, and Professor H. A. R. Gibb. The training of archaeologists was then discussed by Miss K. M. Kenyon, who hoped that students would be attached to British schools overseas after experience in England, and not be fledged by unsupervised trial and error at the expense of sites. Professor J. D. Beazley thought that examinations were no real hardship to healthy young men and women; and deplored the tendency among research workers to regard any subject recently advanced as "killed," whereas it should prove most fruitful. Mr. Harden referred to the danger that archaeology as an acknowledged career would attract "careerists." Dr. F. E. Zeuner advocated short special courses in geochronology, with visits to gravel pits and other sites illuminating "environmental archaeology."

Sir Cyril Fox indicated gaps in local and national records of discovery. Some museums and individuals record what they find, others do not. Hunting up parallels requires lengthy private correspondence; labels and specimens often get separated. A live index is essential. Of the prehistoric ship destroyed in a bombing raid on Hull, no description which is adequate by modern standards exists. Full publication, with State help, of all main finds is vital.

On the crucial topic, "Planning and the Independence of Societies," Mr. J. N. L. Myres led off by declaring himself frankly "not a very convinced planner." The function of the State should be negative, except perhaps in dependent nations. But since private individuals would not be able to defray the cost of necessary post-war enterprises, archaeologists must build up an authoritative body, such as the Council of Archaeology, which can plan, without direct State control. Planning brought the risk of curbing or discouraging individual initiative and regimenting research; voluntary effort and voluntary societies were imperative. An excellent and comprehensive plan which had been drafted in 1930 had become obsolete shortly afterwards through a new discovery. Plans should therefore be used for general guidance only. The creation of machinery should not be confused with the advancement of knowledge. Mr. H. St. George Gray stressed the importance of indexes for series of periodicals, although they seldom cover the cost of publication; and he expressed the belief that public funds were indispensable for local societies. Dr. Alan Gardiner reminded the Conference that the Egypt Exploration Society had originally financed both excavation and publication by one-guinea subscriptions alone, and felt it hazardous to predict future limitations. British initiative was at the base of the best in Britain and the best in exploration. To win support we must deserve it: younger colleagues must be prepared to work harder and to publish more promptly. Personnel mattered more than money. In the discussion, Dr. Grahame Clark pointed out that the great strength of the State after the war would increase the danger that adherents of some specific belief would insist on the misdirection of research, as one had witnessed in certain countries. Mrs. Hawkes objected however that while the State was being represented as a wolf, in fact the sheep did not know where their next meal was coming from.

Mr. W. F. Grimes (Ordnance Survey Office), speaking on "archaeology and the State at home," held that only the State can plan. The Royal Academy plan for London cuts across ancient monuments and remains; and "research is a State function in certain special aspects," *e.g.* on State-controlled sites. The Board of Education should extend its control to archaeology. Licensing of excavations, as recommended by Dr. Schaeffer, was desirable. In common with Mrs. Hawkes, in the previous discussion, Mr. Grimes emphasized that criticism of State planning and control implied a slight upon distinguished archaeologists in the audience who were civil servants.

Dr. Schaeffer described a recent law in France, whereby fifteen supervisors, each covering several provinces, were made available by the State if their advice was required. They were distinguished individuals, serving on a voluntary basis, only their travelling expenses being defrayed.

Sir Leonard Woolley spoke on "archaeology and the State overseas," and quoted the modern motto: " cast thy burden upon the State." The State should always be approached with proposals which are an expansion of projects already in train. The State should not directly finance expeditions; moreover archaeology would lose something of value if it lost the interest of individuals. But Government support was helpful when excavating in certain countries. The British Council believed that archaeological work led people abroad to think that the British were interested in them. Natives of a given country should be included in any research attached to institutes of the British Council; but such enterprises should not be the sole School or society operating in the country concerned. Sir Leonard Woolley also urged that the staff of the British Museum and kindred institutions should be increased, the age limit raised, and field work required. In the discussion, Miss G. Caton-Thompson deprecated linking

research and propaganda institutions abroad, and cited the results observed in certain cases.

Concerning "museums and the public," Mr. Hawkes urged the public to make its wishes better known: was the overlapping of the Victoria and Albert Museum and the British Museum approved, or the combination of the national library with the British Museum? Dr. F. S. Wallis wished three types of museum exhibit distinguished and logically employed.

"Archaeology and education" evoked a report by Mrs. D. P. Dobson on short courses, with appropriate playlets and visits to local museums and libraries, for elementary schools, and a plea by Mr. Philip Corder that prehistorians should begin the compilation of new text-books for secondary schools without delay. Secondary school-children could excavate certain sites without endangering the material. Professor H. T. Wade-Gery hoped that of four years of classical study in universities, one year (or at the very least one term) might be spent in Greece or Rome. Professor D. S. Robertson read a communication sent from Cairo by Professor Wace. Mr. W. J. Varley explained that he gets dockers to help in excavating, and wishes to spread knowledge of archaeology to the masses. Mrs. D. J. Chitty pointed out that in a W.E.A. course of twelve weeks a considerable amount can be taught, depending on the personality of the teacher.

Summing up, Sir Cyril Fox stressed the arguments in favour of planning, and considered that the Council for Archaeology, now in process of formation, was a fully adequate safeguard against alleged risks.

A resolution was passed in favour of referring the views expressed at the meeting to the Council for Archaeology and other bodies, to take such action as they might see fit. It was understood that a full Report of the Conference would appear.

E. J. L.

BOUNDARY DELIMITATION

The *Annals* of the Association of American Geographers for June 1943 (vol. XXXIII, No. 2) has a useful paper by Mr. Stephen B. Jones on "The description of international boundaries." The author collects under physical headings the features which may have to be defined in the agreement for delimitation which precedes the demarcation by a boundary commission, and indicates where special care is necessary. His examples are all from sources in the English language: League of Nations Treaty Series; U.S. Treaty Series; S. W. Boggs' recent book on international boundaries, New York, 1940; and many papers in the *Geographical Journal*. His definitions are generally clear, he covers the ground with economy, and there seems to be happily a general agreement between the American and British views on these matters. One would certainly agree that to determine the true water-parting may require unobtainable knowledge of underground flow, as on the Italo–Yugoslav boundary. It may however seem over elaborate to define the surface water-parting as "the line at which the waters would divide if there were no evaporation or underground drainage."

There is one point of terminology to be made. On p. 32 of his book Mr. Boggs is firm on the distinction first drawn by Sir Henry Macmahon about 1897 between *delimitation*, the determination of a boundary by treaty and its definition in written, verbal terms, and *demarcation*, the definition by boundary pillars or similar means. He does not use the term *description*, which belongs to the last stage of all, the detailed account of the boundary after it has been demarcated. Mr. Jones agrees that "complete description really belongs in the final report of the demarcation commission rather than in the prior treaty"

(p. 102). It is a little confusing that he nevertheless uses the word *description* in the title of his paper and throughout, rather in the sense of definition in written, verbal terms, for the purpose of the delimitation by treaty.

A SEVENTEENTH-CENTURY DESCRIPTION OF HISPANIC AMERICA

In 1930, while searching in the Vatican Library for Aztec manuscripts, Dr. C. U. Clarke came upon a Spanish manuscript, catalogued as anonymous, entitled "Compendium and description of the West Indies." The author was subsequently identified by Dr. Ernst Schäfer as Fray Antonio Vázquez de Espinosa, a Carmelite friar, who had travelled extensively in Mexico and Peru in the early seventeenth century. It was known from contemporary references that he had compiled a valuable work on the Spanish possessions, but this had disappeared, owing to the author's death while preparing it for the press. Dr. Clarke has made a full translation, and this has now been published as volume 102 of the *Smithsonian Miscellaneous Collections*. The English text is given without commentary, but with a careful and detailed index, and in a brief introduction the translator indicates some of the points of interest in a document of great value for the geography and history of Hispanic America. The foundation of the work is a systematic description of the Spanish possessions, the situation and importance of the settlements, the conditions of the inhabitants, Spanish and native, the administrative system, the state of trade, and the natural resources. Vázquez de Espinosa was a keen observer and a shrewd judge of men, who strove to reconcile what he observed with orthodox theological dogma. Above all he shows himself an enthusiast for the wonders, natural and human, of the New World and the achievements of his fellow-countrymen, but does not refrain from criticizing the conduct of Church and State. Historians, botanists, and anthropologists, in addition to geographers will find much of value in his pages. Among the topics to which the translator draws attention are a narrative, derived from a member, of Pedro de Ursuá's expedition down the Amazon in 1559; the earliest known reference to the curative properties of quinine; the eruption of the Urbinas volcano near Arequipa in 1600; and early mining at Potosi and Huancavelica. He has frequent references to French, Dutch, and English incursions, and a short account of Raleigh's ill-fated Guiana expedition. His observations on Indian languages are also important. On colonial and ecclesiastical administration of the period, his book will be a valuable authority.

INTERPRETATION OF AIR PHOTOGRAPHS

The Library has recently bought a useful book, 'Aerial photographs: their use and interpretation.' By A. J. Eardley, University of Michigan. *New York and London: Harper and Brothers*, 1941. $9\frac{1}{2} \times 6$ *inches; xxii+204 pages; illustrations and diagrams.* 15*s*

The interpretation of air photographs has become of great military importance, and discussion of its most modern technique is therefore barred. Nor can one now purchase most of the photographs made for the Soil Conservation Service or the Agricultural Adjustment Administration, or for the other services often referred to, who had photographed whole States and could formerly supply contact prints at nominal prices. The author's first interest had been in geology, and much of the more original material in the present book is discussion of patterns of outcrop, photographic guides for tracing contacts, and suchlike interpretations. The admirable photographs, carefully marked up to show the points of interest, make with the descriptive text a good introduction

to the subject, and incidental references to the military use of this work, and to books in which it may be further studied, will be valuable to many who have not the advantage of following the courses for cadets in the University of Michigan.

In a review on p. 78 of this number Professor O. T. Jones has stressed the urgent need of such systematic photography from the air in Great Britain and the Dominions. A note in the *Journal* (99 (1942) 257) has already described the excellent organization in Canada for supplying engineers and prospectors with air photographs by which they can lay their plan of operations. May one hope that our Ministry of Planning has already in view some machinery for securing to public use the material which must have been accumulated in Great Britain during military training and operations. They need not however adopt the terminology without further thought: geoscience, photo-flying, and stereo-striplets are ugly words.

THE CONTRIBUTION OF THE BELGIAN CONGO TO THE WAR

We have received from the Belgian Information Office a small pamphlet by Walter Ford 'Belgian Africa's total war,' which gives an account of the contribution of the peoples of the Colonial Empire of Belgium to the Allied War Effort. The Belgian Government in London controls the Belgian Congo, the whole resources of which, whether of raw materials or man-power, have been placed at the disposal of the Allies.

The pamphlet shows clearly the two stages in production for Allied requirements: before the entry of Japan into the war, and the loss of Far Eastern products, when the Belgian Government were asked to concentrate on production of gold, to pay for supplies from the United States and stabilize sterling; and after the entry of Japan, when tin, rubber, and tungsten were needed, gold becoming relatively unimportant after lease-lend. The two phases were covered by the Financial and Purchase Agreements signed by the Belgian and British Governments on 21 January 1941, and the Purchase Agreement of 4 June 1942.

The expansion in production of all materials needed for the war effort: gold, diamonds, copper, tin-ore, rubber, cotton, copal, ground nuts and palm oil is considerable. An increase especially remarkable when it is remembered that one-half of the Congo's imports were cut off, and three-quarters of the markets lost with the fall of Belgium, and that many of the companies were run from head offices in Brussels. These difficulties may have been partly off-set by the fact that the Government is a principal shareholder in many of the commercial companies.

INSTRUMENTS IN THE DICTIONARY

In its earlier impressions the 'Concise Oxford Dictionary' defined the theodolite as a surveying instrument for measuring horizontal and non-vertical angles, and one may wonder how the definition got so peculiarly wrong. A much more recent work, the 'Shorter Oxford English Dictionary,' 1933, in two volumes, is more picturesquely misleading. The theodolite is an instrument "subsequently variously elaborated with a telescope instead of sights, a compass, level, vernier, micrometer, and other accessories, and now often with the addition of a vertical circle or arc for the measurement of angles of altitude or depression." The plane-table is a surveying instrument used for measuring angles in mapping, consisting of a circular drawing table mounted horizontally on a tripod, and having an alidade pivoted over its centre. An examinee asked to discuss the errors in the preceding statements would have plenty to say; but it would be hardly fair to ask him about the Oblique Ascension of a star, for he will hardly find the term elsewhere than in that dictionary.

PLANNING AND RECONSTRUCTION

The wide popular interest in planning and reconstruction at the present time is producing a spate of literature: some serious, thoughtful, and constructive, but much ephemeral, ill-digested, or frankly propagandist. There is now a very general appreciation that the haphazard development of our land and its resources in the past has brought undeniable evils in its train and that some form of guidance in conformity with a well-considered national plan is desirable. There is however a very real danger of a reaction unless the schemes for such guidance or control when examined carefully are shown to be founded securely on an adequate factual basis. Those who advocate planning are, in fact, their own worst enemies. Therein lies the danger of the work of the Association for Planning and Regional Reconstruction—a private association incorporated as a limited company not run for profit. It holds fortnightly discussion meetings of which cyclostyled reports are issued and has a small permanent staff of workers fired by enthusiasm. The association has published a number of attractively printed " broadsheets " of four pages, of which Nos. 1 to 11 have been received by the Society. In these there is much that is interesting, some that is good, but in which serious investigation is mixed with propaganda. Thus Broadsheet No. 1 deals with the Delimitation of Regions for Planning Purposes: a most complex problem of which a summary in less than three pages gives only a false impression. No. 5, on the "Production of Fresh Food" has some diagrams of land utilization in England and Wales based on some figures published in *Nature* which were certainly never intended to bear the construction placed on them. No. 9, on "Regional Boundaries in England and Wales," afforded a golden opportunity of showing and analysing the boundaries actually used, in extension of Gilbert's work in the *Geographical Journal*, but instead produces a summary map of very limited value. L. D. S.

ELECTIONS

The following have been elected Fellows of the Society:

On 26 June 1943: Rev. C. Gordon Beacham; Miss Andrèe Juliette Carlier; Sidney Correll; Dr. Augustus Edward Gibbs, L.R.F.P.S., L.M.S.S.A., B.SC., PH.D.; James S. Gregory, B.A.; Captain Joseph Edwin Barwis Holliday, R.A.; Miss Gwendolen Leijonhufvud; William Albert Loweth; Ven. the Hon. S. H. Phillimore, M.C.; Scott Varley Scott-Mitchell

On 19 August 1943: Miss N. M. Baker, B.A.; Dorian A. Blair, A.M.INST.B.E., F.I.L.; Alfred C. Bossom, M.P.; R. H. E. Stedman Clubb; Reginald Goodfellow; Mrs. Tranchell Hayes; Captain W. R. Jones, M.A.; Captain St. J. L. Mann; Captain John T. Murray, PH.D., M.SC., M.A., F.R.S.A., R.E.; Albert Edward Fowler Thomas; Captain Ronald Arthur Tinker